domat
control system

DOMAT PRODUCT OVERVIEW

Energy under control

CONTENTS

COMPANY PROFILE

Domat Control System provides a comprehensive range of systems and products for building and energy control and measuring systems. The company mission is to develop, produce, and distribute building and industry control systems worldwide. We at Domat Control System focus on reliability, advanced technologies, modern communication features, remote access, and flexibility: the system development is able to swiftly respond to customer's demands which is a must at today's projects. Standard signals, interfaces, and communication protocols are used at all system levels. Therefore the system is open for a wide range of integrated solutions.

BUILDINGS AND INDUSTRY

Domat Control System presents a complete solution for intelligent buildings, monitoring of energy efficiency, data management and integration of other building infrastructure systems: utility metering, fire and security systems etc.). Control hardware and software is developed and assembled in the Czech Republic and its industrial designs are protected. The company team has long-term experience in HVAC controls and energy management systems design, commissioning, and service at international projects.

SOLAR SYSTEMS, ENERGY MANAGEMENT

Domat Solar System monitors all available functions of solar power plants and controls active power and power factor where necessary. It also communicates with the control system of the distributor and exchanges grid control signals. The monitoring system collects data at the lowest possible level. It uses smart algoritms to detect string power deviations whilst considering the impact of clouds, snow, or high temperature to avoid false alarms. The data is available over the Internet. All the above mentioned enables the investors to maintain proper functionality of their solar plant at reasonable costs.

RESIDENTIAL HOUSES

Domat Home System controls individual room climate in residential buildings.
The room controllers are linked over a web interface to a PC. Users may monitor and control heating, air-conditioning and ventilation systems. The system is also adaptable for complex solutions with bivalent or trivalent energy sources (gas boiler + heat pump etc.)

DOMAT INTERNATIONAL

Based in the Czech Republic, Domat Control System coordinates its daughter company in Slovakia and a network of system partners in Croatia, Hungary, Malaysia, Germany, The Netherlands, Austria, Romania, Italy, Slovenia, Portugal, and Switzerland.

PRODUCTS AND SERVICES

- Consulting services and design of HVAC controls and building control systems
- Comprehensive, turn-key solutions of HVAC and building control systems and system integrations
- Sales of hardware and software components to system integrators
- Free trial of system components and licences for 30 days
- Free trainings for designers, software engineers, and users
- Technical support and free proofreading of your projects and shop drawings containing Domat components
- Service and updates of turn-key installations

SYSTEM ADVANTAGES

1 User comfort:
- Web access at automation level, easy-to operate SCADA graphics, flexibility, fast and safe installation

2 Open system:
- The system is open for integration of most of the products and communication protocols available on the market

3 Compatible communication:
- Integration of 3rd party terminal units e.g. over Modbus RTU
- data collection from utility meters over M-Bus protocol brings compatibility and coexistence of different media meters and meter manufacturers at one bus

4 Complete system:
- From room sensors to database applications, the product range features components for all system levels

5 Energy savings:
- Smart control of energy production and distribution, e.g. based on weather forecast

6 Price:
- Competitive pricing, low service and maintenance costs, strong support of system integrators

7 Individual technical support and trainings:
- Training and Technical Support Center
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HIGHLIGHTS

Domat Control System perceives its commitment to provide advanced solutions and up-to-date technology. As a consequence, we always do our best to introduce new products, services and product updates on a frequent basis. Below please find the list of the most important changes in the company portfolio.

IPLC201, 301 Power PC process station

The core process station with integrated web server now comes with upgraded process control thanks to Power PC processor and improved process control. The amount of physical data points to be handled by one process station is more than three times larger. This means extended functionality for the same price as of its predecessor.

ECIO2 Compact I/O Ethernet module

Innovated compact I/O module with Ethernet and RS485 interfaces. The ECIO features 30 inputs and outputs and uses Ethernet for communication with the process station. It works as a Modbus TCP / RTU router at the same time: it is possible to connect more I/O modules over the RS485 interface and create remote I/O islands in offices, production facilities etc.

US100 Room controller with blind control

The communicative controller range has been extended by US100, radiator controller with blind control buttons. Instead of the knob, there are five pushbuttons to control room status, temperature setpoint, and blind position inclusive slat angle. Thanks to standard Modbus / RS485 communication, the controllers are easily integrated to any open SCADA or PLC system. Of course, the blind position and all other parameters may be overridden from the PLC or supervisory station.

HT100 Panel Terminal

For robust operation and harsh conditions, the HT100 Panel Terminal with IP65 front panel protection degree is the right choice. It initiates connection with up to four SoftPLC runtimes or MiniPLCs over TCP/IP, and displays process values in a free definable tree structure. Users are allowed to set time schedules, acknowledge and reset alarms, change setpoints etc. Certain groups of datapoints may be protected by PINs to enable multiuser access policy. The terminal is delivered with Modbus RTU / IP protocols as an option.

SoftPLC Proxy

Sometimes, the PLC is installed at places where no public / fixed IP address is available. Even those PLCs can be reached from the Internet using the SoftPLC Proxy service. The PLC establishes an outgoing http connection to a proxy server in the Internet. Under the same ID and password connect also the clients, such as RcWare Vision, Touchscreen, Web server, OPC server, HT100 Panel Terminal and the like. The clients then have read and write access to the SoftPLC process values by sharing the proxy server database. This reduces connectivity costs and makes possible to connect the SoftPLC runtimes over the Internet without configuring NAT and / or routing.

MW240 Module for control of lights

Small I/O module with 2 inputs for pushbuttons or switches, and two 230 V / 5 A relays, fits in a flush mounting box under a room switch. It controls two light groups on both local and remote basis. Communication over Modbus / RS485 makes the MW240 easy to integrate into SoftPLC / MiniPLC process stations as well as in 3rd party systems. The module responds to local and remote commands based on priority settings, so that e.g. individual control over the daytime and central switch-off command in the evening is possible.

SYSTEM OVERVIEW

1 Energy management system

RcWare Manager is a software package for energy consumption analysis – a customized database client for history data processing. RcWare Manager evaluates energy flows in buildings and exports the processed data into enterprise management systems. It is a tool for system optimization, effective energy saving, and performance contracting services.

2 SCADA

The RcWare Vision SCADA supports both plant graphics and tabelar access to the datapoint values and properties. It provides flexible topology, alarm processing and messaging, trend data sampling, and extensive integration potential for Domat Control System controllers as well as for 3rd party PLCs and control systems.

3 Process stations

The heart of the Domat Control System topology are process stations with the RcWare SoftPLC runtime, free programmable DDC application with both universal and HVAC-specific function blocks. Process stations with touch screens use graphical HMI interface for supervision and control.

The platforms used are Windows XP Embedded, Linux, and dedicated OS, according to communication and performance demands.

4 I/O modules

The Domat Control System input and output modules provide standardized interfaces between the process and the control system. They are used for process controls and for data acquisition in metering systems as well. Standard modules (4/8 DO, 8/16 DI, 8 AI, 8 AO, counters), and compact modules with HVAC-optimized I/O mix are available. Communicative room controllers are also integrated at this system level.
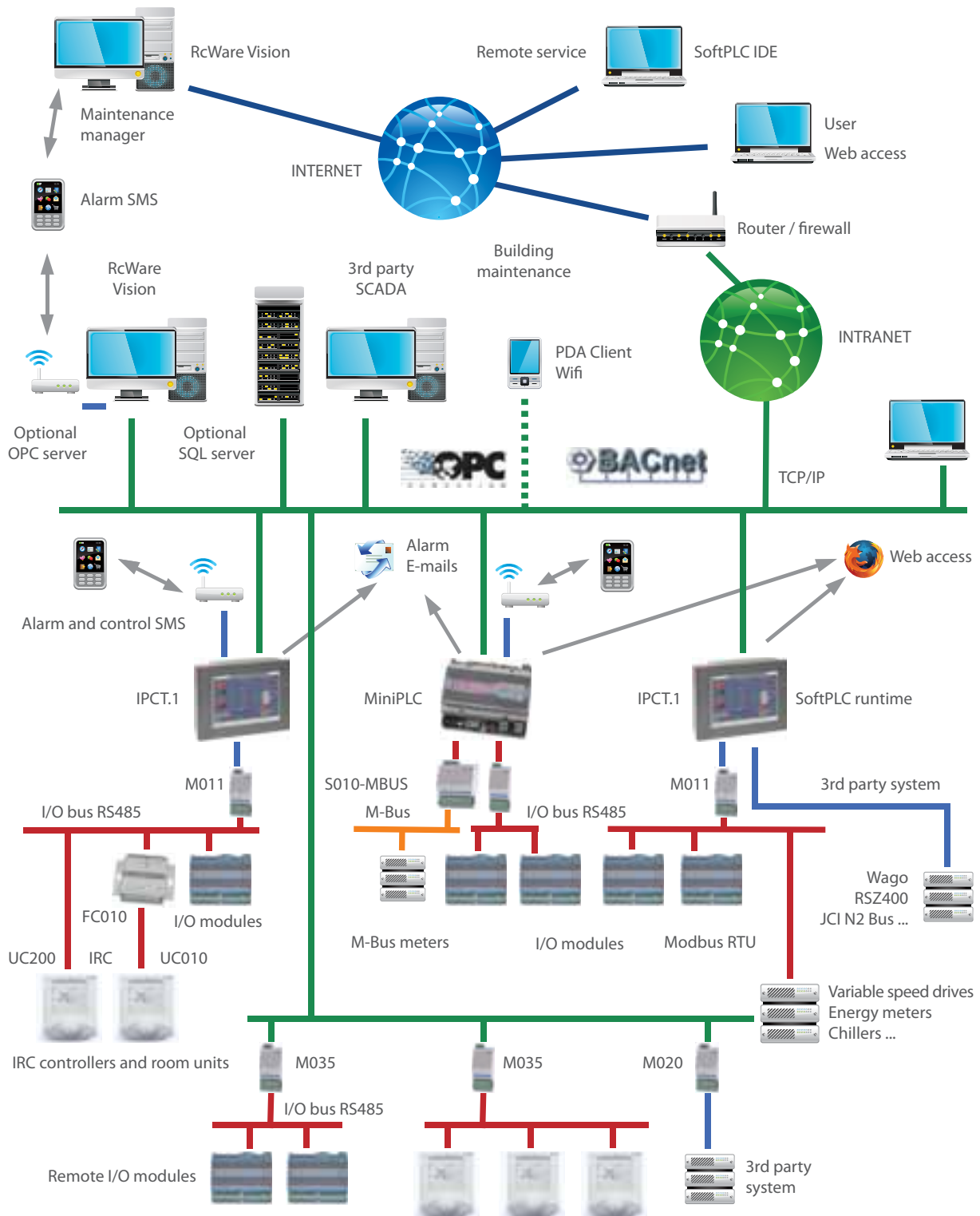
5 Peripherals

A broad range of Domat Control System peripherals: temperature, humidity, pressure, air quality (VOC, CO2, ozone), and light sensors with standard outputs for both indoor and outdoor usage. Thermostats for air and water, safety elements, and other components provide reliable data for the superset system layers.

Design room units and sensors (even customized) and valves up to DN150 for hot water, air, and cooling media make the range complete.

SYSTEM TOPOLOGY

RcWare Vision

Remote service

SoftPLC IDE

Maintenance manager

User

Web access

Alarm SMS

INTERNET

RcWare Vision

3rd party SCADA

Building maintenance

Router / firewall

PDA Client Wifi

INTRANET

Optional OPC server

Optional SQL server

OPC

BACnet

TCP/IP

Alarm E-mails

Web access

Alarm and control SMS

IPCT.1

MiniPLC

IPCT.1

SoftPLC runtime

M011

S010-MBUS

M011

3rd party system

I/O bus RS485

M-Bus

I/O bus RS485

Wago RSZ400 JCI N2 Bus ...

FC010

I/O modules

M-Bus meters

I/O modules

Modbus RTU

UC200   IRC   UC010

Variable speed drives Energy meters Chillers ...

IRC controllers and room units

M035

M035

M020

I/O bus RS485

Remote I/O modules

3rd party system

MINIPLC CONTROLLERS

The range of free programmable DDC controllers MiniPLC by Domat Control System is offering open system features right from the automation level.

The controllers are of two types (IPLC201 and IPLC301) and provide following interfaces:
• 1x RS485 for I/O module bus (ModBus)
• 2x RS232 / 2x RS485 for GSM modem for alarm SMS or system integration (e.g. M-Bus) – IPLC301 only
• Ethernet for communication with a touch screen or SCADA system – either native (TCP/IP) or over an OPC server.

Each controller embeds a web server for easy supervision and control through a web browser. To engineer the applications and HMI, the RcWare SoftPLC package is used. It is provided free of charge in the basic version.

The web HMI is engineered in a graphic editor so that no HTML knowledge is necessary. There are objects with displayed and set values, switches, alarms, graphs, time schedules etc. in the library.

An intuitive editor which defines a flexible tree menu structure (measured values, set values, alarms, schedulers, PIN protected areas etc.) is used while creating the LCD display menu.

The I/O bus links the Domat Control System I/O modules configured according to the I/O mix of the plant. The MiniPLC can host up to 300 - 400 physical data points, depending on complexity of the application program. The most favourite module is the MCIO2 compact I/O module, containing a HVAC-optimized I/O mix:

• 8 AI (Ni1000, Pt100, Pt1000, T1, 0..10 V)
• 8 DI (24 V AC/DC)
• 6 AO (0..10 V)
• 8 DO (relay 230 V / 5 A, 6x NO, 2x change-over contact)

MiniPLC is the best choice for heat exchange stations, boiler rooms, or HVAC units up to about 400 I/Os, connected over a network – be it to a SCADA system or just for web access. Typical examples are heat exchange stations with several heating circuits and DHW preparation, small hotels with gas boiler, AHU, and 20-30 rooms, or heating and airconditioning of a residential object with integration of other technologies, such as pool heating, outdoor lights, watering system etc.

All MiniPLC stations communicate in an Ethernet network among each other but they also can exchange data with 8" touch screen controllers IPCT.1 so that the system topology can be easily expanded.

MiniPLC offers economical, reliable solution for small systems with native web access. Alarms are listed on the LCD display and sent by e-mail, the IPLC301 can host a GSM modem and transmit SMS alarm messages as well as receive control messages to control the plant and set temperatures, operation modes and other values.
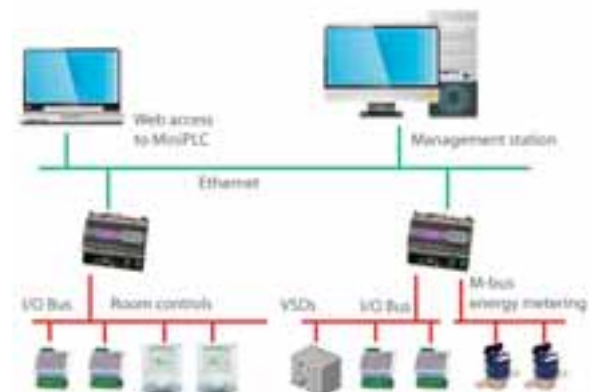
The I/O bus connects the I/O modules which can be distributed up to 1000 m apart, while the controller is installed close to the user who can control the technology either locally or remotely over the network.

Network access includes web browser access, touch screen for comfortable control of one or more MiniPLCs, and / or management station hosting RcWare Vision or another open SCADA system. MiniPLC controllers are part of the open control system by Domat Control System – for seamless integration into other control and SCADA systems, the OPC server and Modbus RTU server is delivered free of charge, and heat, water, and energy meters and other technologies (e.g. heat pumps or variable speed drives) are easy to integrate even at the process level, as MiniPLC supports standard protocols as M-Bus and Modbus RTU. For special and customized applications, MiniPLC can be extended with user-specific program modules and functions, e.g. communication protocols, functional blocks for which customers provide their own code, etc. That is why MiniPLC is suitable also for industrial process control.

PROCESS STATIONS, I/O MODULES

The IPCT.1 process station is an embedded computer with no moving parts providing standard interfaces: Ethernet, COM ports, USB, audio, keyboard, mouse. It hosts an operating system (Windows XP Embedded), process control software SoftPLC, and touch screen HMI application.

The Ethernet port links to SCADA and hosts peer-to-peer communication at the same time, the I/O modules and peripherals are connected to serial ports over separating interface converters. The I/O modules are powered by 10 to 30 V DC or 12 to 24 V AC. Inputs and outputs, power part and communication are optically separated from each other which prevents the rest of the bus from damage in case of overvoltage at one module.

Each module is addressed by a configuration software. Analogue inputs are entered with their measuring range: either they are declared as active (0..10 V) or passive for connection of all common temperature sensor types. For special sensor characteristics, each input can be separately linearized with freely defined linearization curve.

Digital outputs with relays can switch directly 230 V AC low voltage, so that for small loads no separate contactors / relays are necessary. Digital inputs and outputs statuses are indicated by LEDs. Some of the digital output modules provide manual intervention buttons.

The modules communicate over a RS485 bus with Modbus RTU and configurable baudrate. Using

a standard protocol, they provide an open I/O bus also for 3rd party manufacturers. The other way round, 3rd party devices, such as variable speed drives, IRC controllers, and energy meters using one of the supported protocols can be integrated directly into the process station. Sometimes they can be even connected to the same I/O bus as the I/O modules, providing integration at the I/O level. The process station is usually installed at a place accessible for the maintenance staff. As the I/O bus may reach up to 1000 m, data from the whole building can be linked to one process station, or more panels with I/O modules can be connected together to one process station, which saves cabling costs.

A process station may have – same as a MiniPLC – a web server enabled, so even without a SCADA system the process data can be accessed, setpoints changed, schedules set, trends monitored etc.

in a dynamic vector graphics. A process station can be connected over the Ethernet to other stations and / or MiniPLCs and share data – outside temperature, load shedding signals, energy demand signals, etc. This is possible – thanks to TCP/IP – even in distributed and large networks of a company, city, or in the Internet.
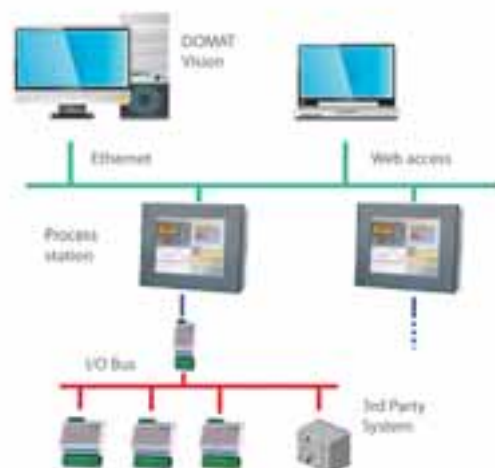
ROOM UNITS AND CONTROLLERS

Design range of communicative room units and controllers brings new dimensions in room controls. Large LCD display (60 x 60 mm) displays room temperature and status so that the data are visible up to 5 m distance. With a push/turn knob both temperature correction and operation mode change is easy, as is multi-level parameter setting inclusive weekly schedule plan.

For air handling units, small boilers, A/C units and other devices, universal room units are the best choice. They provide basic functionality (room temperature, room setpoint, operation mode setting) as well as more complex functions: heating curve selection, DHW setpoint, relative humidity and air quality display and setting, etc. The set of functions to enable is configured at the commissioning time. For example, the set of operation modes may be residential (Day, Night, Auto, Off) or hotel/office (Comfort, Standby, Party, Off). Each mode provides separate setpoints for heating and cooling. The configuration software is free of charge.

The universal room units are available also with one digital output for control of e.g. radiator valve, and two inputs and two outputs for e.g. presence sensor and window contact, and control of heating and cooling valves. The control algorithm is not part of the room unit and must be configured in the process station, which gives more freedom to the application engineer.

Individual room controllers, on the other hand, provide independent control functionality with PI or on/off algorithm, together with the operation mode logic. The setpoints are predefined and therefore only bus address must be set at the commissioning time, optionally with enabling or blocking other functions (valve protection, change-over, selected operation modes, time scheduler etc.)

The UC100 room controller provides one SSR PWM output to control a thermic actuator or electrical heater, UC200 features two outputs for heating and cooling, and two inputs for presence sensor (e.g. from a card reader or IR sensor) and window contact or dewpoint sensor for systems with cooling panels.

Floor heating is controlled by UC300, a communicative controller with an extra analogue input for a Pt1000 floor temperature limitation sensor.

To control fancoil units, choose FC010 with room unit UC010. The controller has three relays for a 1 to 3 stage fancoil, two PWM outputs for heating and cooling, and two inputs for presence sensor and window contact. The small controller body fits to the fancoil easily with two screws or a DIN rail holder. The controller communicates with the room over a RS485 bus.

The FC020 features analogue inputs, and therefore suits perfectly to plants where the communicative room unit with display is not the right choice or where a room unit can not be installed at all, such as corridors and public places. Analogue outputs for heating and cooling are also available here.

In the range there are also room controllers with Ethernet communication (UC150, UC250), room temperature and humidity sensors with Ethernet, PoE and Modbus/TCP communication, with or without LCD display, signalling units UI400 for commercial refrigeration, and other customized devices.

The controllers and room units communicate either with a process station, which reads energy demand signals to control primary plants and sets central depression modes, or with a SCADA station over a serial converter or Modbus RTU / IP router. For small installations, such as residential houses and family hotels, the web interface UCWEB is an easy way how to manage the rooms over the Internet, and control a boiler or a heat pump.

All room units and controller provide open communication over Modbus RTU / TCP and because of wide power voltage range they are suitable not only for the Domat process stations and SCADA, but also for any open control or SCADA system. They are available in five basic colours (white, grey, beige, dark grey, and pastel green).

SOFTPLC ENGINEERING TOOL

SoftPLC IDE is a software package for application development, or programming of the control system. There are runtimes installed in the process stations which process the project data. A runtime may also be run as a system service (no need for user login etc.).

Part of the runtime are communication drivers both for Domat Control System I/O modules and for other standard protocols (Advantech, Modbus RTU, Modbus TCP, BACnet, M-Bus, OPC client), as well as drivers for numerous 3rd party systems.

A runtime may run even with no I/O modules connected and thus it can be an effective tool for control applications in data acquisition systems with OPC communication.

Projects are created in the Integrated Development Environment – IDE – as sets of interconnected functional blocks. Applications are fast to create and easy to maintain.
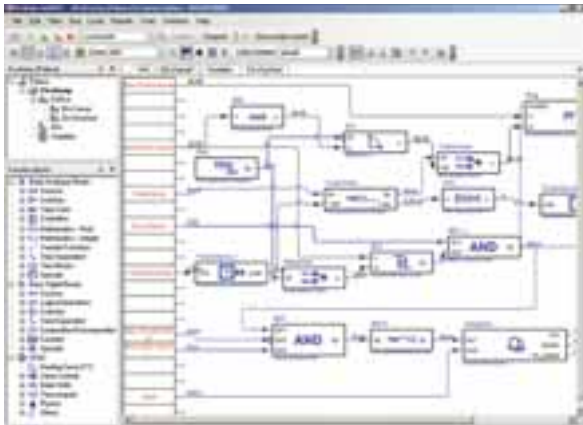
The editor contains a comprehensive function library with HVAC function blocks. In the library, there are basic analogue and digital blocks, mathematical functions inclusive goniometric and logarithmic functions, PID controllers, time schedulers (binary, multistate,
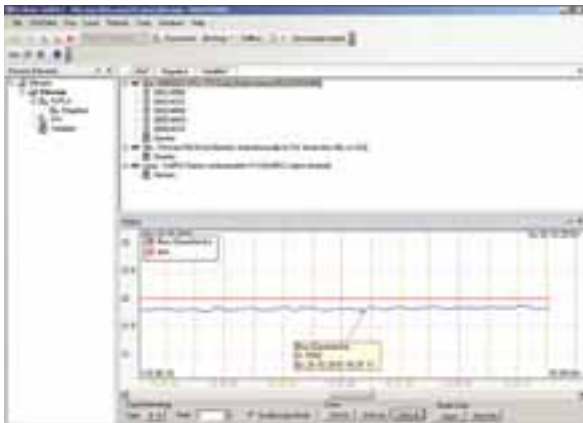
and analogue), counters, alarm blocks, and special functions for HVAC applications (heat recovery, dewpoint, heating curve, average temperature in time, load shedding (E-Max), pump kick, advanced energy metering etc.).

Commissioning is fast and comfortable with communication test function: there are online process values visible in the schemes and selected values can be trended which makes tuning of the control loops easy. Context-oriented help describes the function blocks in detail, and provides examples of proper or typical usage.

Touch screen panels, web pages, and LCD menu are created in the Touch Screen Editor.
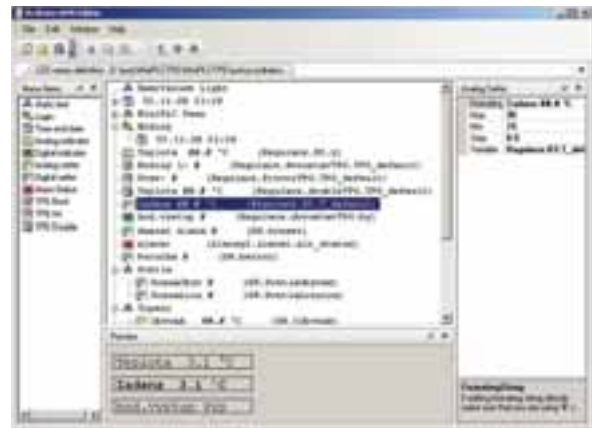
Other programs in the package are:

OPC server for integration of SoftPLC into 3rd party systems

Touchscreen – a HMI module for touch screen displays, alarming, SMS and e-mail communication

PDA – a HMI for Windows Mobile and PocketPC platforms

Webpanel – a robust web server supporting vector graphics and dynamic values update including online trends.
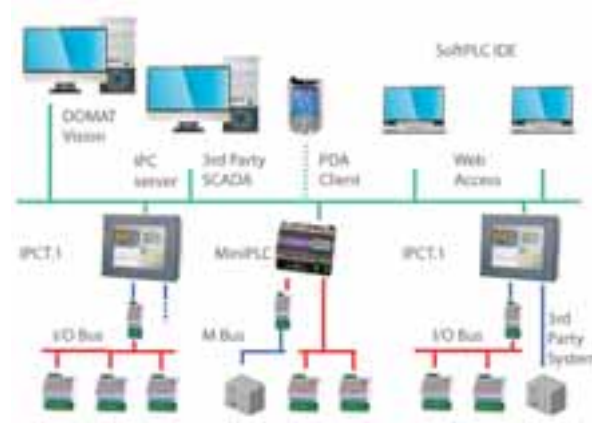
TOUCHSCREEN AND WEB PANEL

Graphical human-machine interface (HMI) plays an important role in the SoftPLC family. However, it may be used not only for the Domat Control System I/O modules and SoftPLC process logic. The runtime is able to run as a data source for SCADA. In those applications, only I/O channels and variables are defined, there are no PLC functions in the runtime. Therefore no PLC programming knowledge is necessary to set up the communication.

The Touchscreen application then acts as an universal HMI for a variety of PLCs which use standard communication protocols, such as OPC, BACnet / IP, Modbus RTU or TCP, M-Bus etc. Drivers for 3rd party systems may be used, too (Landis & Gyr, Saia, Advantech, Johnson Controls, and more).

In the Touchscreen Editor then create graphical panels containing texts, images, buttons, embedded or full-page graphs, value indicators etc. The resolution is freely definable: use any of the predefined standard resolution, or enter your own. The data is stored in a vector format and Touchscreen is able to adapt the panel size to the actual screen resolution: it is not necessary to redraw the project in case the display resolution changes e.g. due to upgrade.

The application includes a generic dialogue for alarm management inclusive alarm history. The SoftPLC alarms may be acknowledged and deleted, all user actions are recorded in the Alarm History. Entering values may be protected by a PIN code, while alarm acknowledge rights may be set as not protected for easy operation.

The Touchscreen also provides time scheduling functionality; there are three types of time schedulers: binary, multistate, and analogue, to enter any value within a predefined limit. In the schedules, there are definable exceptions such as school holidays, national holidays, etc.

One Touch screen application is able to access multiple runtimes over the network, one runtime can host more Touchscreen applications. The topologies are created according to customers' needs and dif-

ferent technologies may be controlled from different places worldwide.

An important part of the application is SMS and e-mailing module. Each alarm is able to send a separate message with definable addressee, subjects, body, etc. It is even possible to control values over SMS according to simple scripts defined by the application engineer. The user is not forced to enter complex strings, he or she can define how the SMS should be composed. The Touchscreen includes list of phone numbers granted to change values while messages from other phone numbers are ignored.

The application development in Touchscreen Editor is very convenient and easy: at the SoftPLC trainings only less than one hour is devoted to explain and practice it. Users appreciate its intuitive menus, rich editing functions and multiple objects editing, which speeds up engineering. The ready project may be exported for web by one click. The panels with live values are then available anywhere in the net including embedded graphs and value change functionality. The Touchscreen also ports into the Windows Mobile and PocketPC environment. The process data is available using PDA, tablets, smartphones and other mobile devices.

An extremely fast and cost-effective way to integrate SoftPLC data into any OPC-capable SCADA is the SoftPLC OPC Server. For the costs of a SoftPLC runtime licence and with minimum engineering effort it is possible to install a Modbus / OPC server, BACnet / OPC server, M-Bus / OPC server, etc., while – unlike with common OPC servers – it is possible to perform any arithmetic and logical functionality in the SoftPLC runtime (e.g. average, maximum, minimum, additions and subtractions, bit decomposition, counting, etc.) and provide the results to the OPC client.

To communicate with master PLCs over a serial line, install the Modbus RTU server add-on: an easy way to transfer data from the SoftPLC runtime (for example, from PLCs by all the above mentioned manufacturers) over RS232 or RS485 to another PLC communicating as Modbus RTU client.

RCWARE VISION

RcWare Vision is a SCADA system with rich possibilities of integration. Its recent versions take advantage of the most modern software tools and communication standards (e.g. Microsoft .NET). This means full backward compatibility and advanced subsystem networking of data acquisition and control stations at the same time. The modularity of the system enables gradual construction of dispatching sites from the most simple visualization of metering data to distributed integrated systems. Special focus is put on high reliability, fast application engineering and easy setup even for less experienced users. The licensing policy makes the system available even for the smallest sites while large datapoint number licenses possess an upper price limit.

RcWare Vision is designed to make use of all the features of the MS Windows 32-bit operating system, series NT/2000/XP/Vista. The application environment is easy to use and comprises all the tools and views for less experienced users. It contains complex tools for system administrators for application creation and maintenance at the same time.
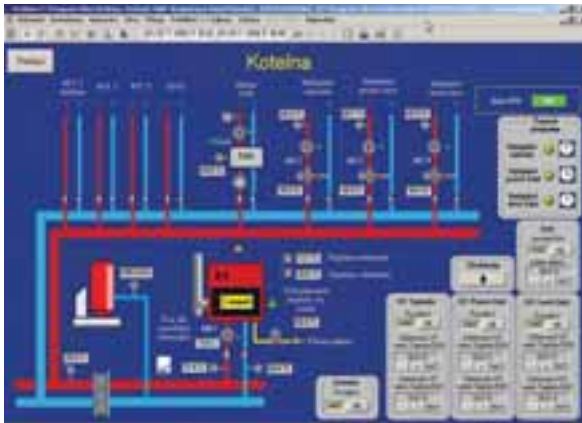
Plant graphics

For fast and clear overview of values and controls, dynamic pictures - technology schemas are the right means. The schemas are of free-definable size and may contain following elements:

- text – free definable text with complete Windows font formatting properties

- bitmap – fixed size or stretchable, also possible as background picture

- value indicator/control – various shapes and sizes, free definable colours etc.

- button – jumps to another schema

- shape – basic geometric shapes

- line – connecting lines with pipe functionality

- animation – symbol changing bitmaps according to the state of one or more datapoints

- time program – week schedule

- heating curve – graphic representation of a four-point heating curve

- graph – online trend with one or more values

As bitmaps, *BMP, *JPG, *JPEG, *ICO, *GIF, *EMF, and *WMF files can be used. Files with dynamic screen definition are saved to the files with a *.SCH extension and each screen is stored in a separate file which makes servicing and upgrade easy.
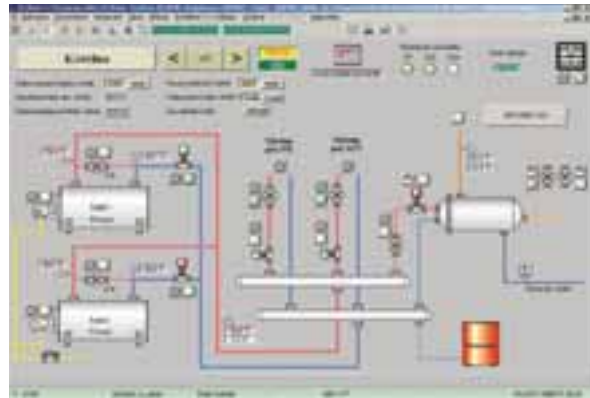
Data point editor

The data editor is the basic component for creating of the database which is used for communication. The data editor window contains two main parts:

- tree view
- datapoint table.

The system is configured by defining and editing communication channels (serial lines, remote RS232 over Ethernet ports, OPC, etc.) and data points. Various editing functions and hot keys are available for import, copying, moving, inserting and deleting of datapoints incl. group functions. Within a datapoint, recalculation of measured to actual value can be made, as well as alarm limits and unit assignment. This is also where communication parameters are set. The basic application is ready in less than a hour.
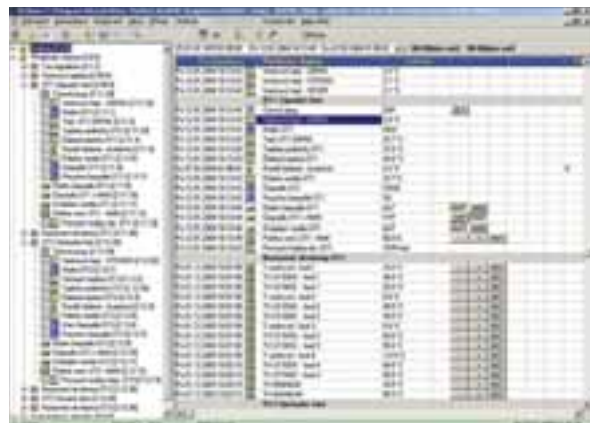
RCWARE VISION

Web access

RcWare Vision uses Microsoft Internet Information Server and its own libraries for linking the process graphics and data to the web server. The access rights for individual RcWare users are set up separately in the Data editor of each project and screen separately. Each user can be granted access to a group of schemas only (and optionally change values). History trends are also available over the web access, with a comfortable menu where users choose from predefined templates and time spans to display. The plant graphics looks out exactly the same as in the SCADA, there is no need for extra web-specific engineering. The only action which needs to be taken is to configure the web server which is a matter of 15 minutes.

Scripting

For complex data processing, computing and logic functions, script data points can be defined. The scripting language can be either classical RcWare (based on existing systems) or JScript.NET. The scripting data point reads value of one or more other data points and provides the results at its interfaces.

Logging

User and system events are logged into a database. There are filtering options to focus the events of interest. Custom filters can be saved and retrieved. Event logs can be printed and exported as text files for processing in other systems. The log databases are shared among the stations – it is possible to check the logs from slave stations at the master station.

Alarming

Each datapoint can be defined as an alarm datapoint. For binary and discrete values, each possible value in the list can be defined as alarm value. For analogue values, upper and lower alarm limits may be defined. Each alarm point has an insensivity time period (switch-on delay). After this time span an alarm message is initiated, which can be forwarded to:

• alarm phone call
• SMS message
• pop-up window
• voice message (to the management station sound card).

There is a log of all sent SMS with optional forwarding to another user. The alarms can be filtered and sorted according to various parameters, for easy localization of the alarm. There are "Find in text editor" in the graphics and "Find in pictures" functions available. Those functions locate and focus the corresponding datapoint in the data table or in the plant graphics.

Trending

Selected datapoints store their values periodically. There are two types of history data:
• long term history: saved permanently to text files or SQL database, for long-term analysis
• short term history: several days back, faster sampling, for trending, tuning loops, and problem analysis.
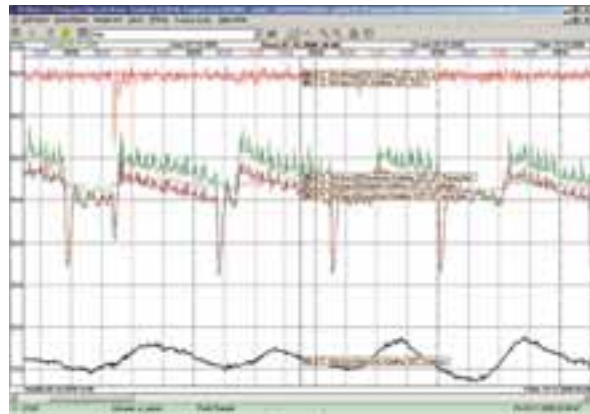
The sampled values can be displayed as a graph and exported to .CSV or .XLS files. The export may also follow automatically on a periodical basis. The SQL database is open for 3rd party programs so that the RcWare Vision station can be used as a data integrator, providing actual values e.g. over an OPC server, and history readouts over a SQL database or/and automatic export files.

Communication drivers

The range of drivers is updated continuously, new drivers are added on demand. Recent drivers and program improvements are contained in hotfixes which are free for download from the RcWare web site.

The system contains drivers for standard open protocols (OPC client and server, BACnet, Modbus TCP and RTU, M-Bus), meters (IEC61107, M-Bus for about 30 meter types, UPS), other PLC protocols such as SAIA, Simatic, Advantech, Landis & Gyr (RWP80, PRU, RVD235), Sauter (EYZ2400), Johnson Controls (9100), Staefa (NICO), AMiT, Teco, Linde, and many others.
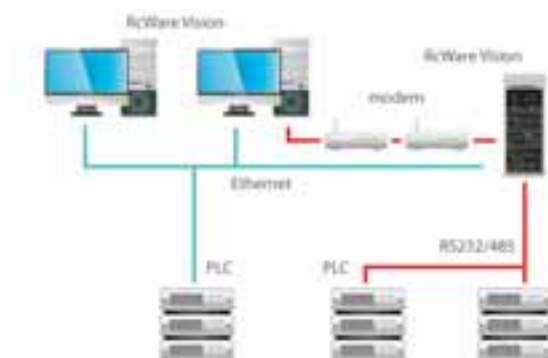
PHOTOVOLTAIC PLANTS

In 2009, Domat Control System installed energy monitoring system at one of its first photovoltaic power plants which nowadays represents a reference example of company state of the art solution and experience in this field. Total installed power of this plant is 1.9 MWp and the panels are located in 7 arrays, 10 to 15 strings each. The monitoring system reads out DC current in each string, and is able to detect if the string provides less DC power than expected. The algorithms are sophisticated enough to distinguish between a temporary power decrease or dropout due to snow coverage, cloudy weather as well as for instance and long-term or permanent power loss caused by panel failure or dirt. Alarms are communicated to a management station together with actual DC current values, data from the AC output energy meter, and data from the inverters which are read over the bus. The management station also provides web interface

so that the plant owner can see actual output power, daily and monthly yield, and other values, such as radiation intensity, and panel and outside temperatures. All data are recorded into a database for long-term effective evaluation. The energy monitoring system installation is one of the conditions for insurance companies to provide insurance for losses, damage, and dropouts of energy supplies. It also helps to keep the plant in optimum condition over its whole technology lifetime. The database provides documented API for integration into a customer's ERP system. There is no yearly monitoring fee; the complete solution inclusive data is in control of the user.

LUMEN ENERGY MANAGEMENT CENTER

One of the activities of Lumen a.s. is service and maintenance of photovoltaic power plants. Thanks to the Domat energy management system (EMS), all data from the maintained plants is brought to a common platform and presented to the Lumen service engineers. The system is closely bound to the management and service database which controls the entire workflow: service agreements, preventive maintenance planning, alarm messaging, plant visit, and invoicing. Authorised service engineers have access to the complete process data, but they also can remotely access the process logic controllers at the plants and, if necessary, modify the application software to fit customer demands or the latest know-how. This reduces servicing costs and response time. For daily operation and maintenance, customized plant graphics with easy-to-operate trend definition is the best tool. To provide more extensive analysis of plant operation, data are exported to open formats so that they can be processed in e.g. MS
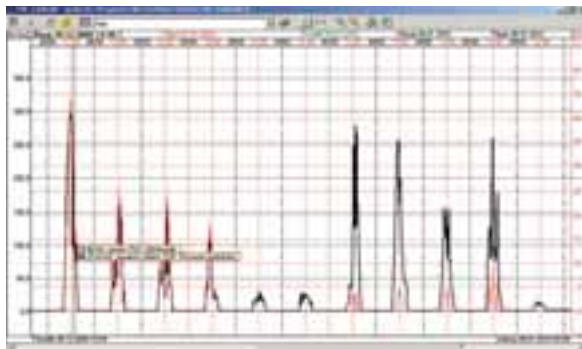
Excel, which provides uncomplicated and cost-effective tools for various analysing algorithms and functions. Resulting proven functions may be implemented in the service database system to simplify operation. The EMS software is prepared for continuous extension as the number of connected sites increases. There are no additional licence nor hidden costs (such as drivers, datapoints, function modules etc.), which helps the customer to attach new plants and acquire new clients with ease. As of February 2011, total of 33 PV plants are serviced and monitored by the Lumen Energy management center.
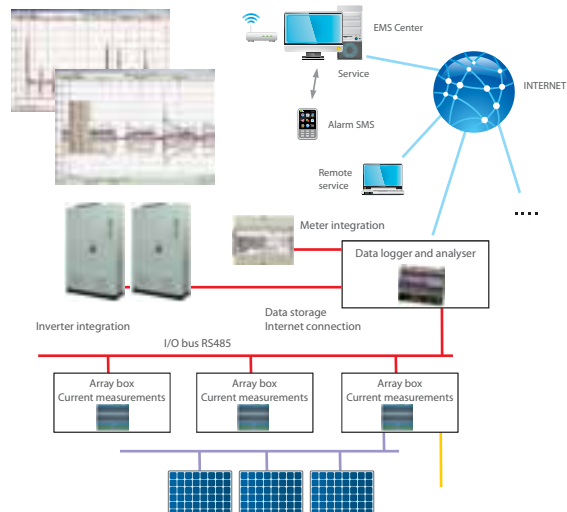
REFERENCES

City Centrum České Budějovice

In 2008, a multi-purpose building of City Centrum České Budějovice has been finished. In the ground floor the visitors find a shopping mall with a cafe and in the first floor there is a variety of services: bowling, fitness, sauna, massage, and rehab studio. In the first and second floor there are snack bar, sport bar, and restaurant. Those areas are connected to the winter stadium. There are 320 office rooms in the building, facilitating radiators and cooling panels with central supply of pretreated air.

The building management system integrates all important technical systems of the building – HVAC, security, fire safety, fire dampers, AHU units in the server rooms, and integrated room controls. Meter readouts are important for effective operation of the plant: the system reads data from more than a hundred meters of power, water, heat, and cooling energy. Some of the readouts are automatically sent by e-mails to the utility suppliers.

The BMS also controls lights in public areas, and commercial outdoor lights.

Most of the datapoints is stored as trend data for analysis and optimization. The alarm system indicates system failures long before they influence the indoor comfort.

District Heating Network, Trenčín

The district heating provider in the city of Trenčín, Slovakia, decided to upgrade all its 30 boiler rooms and 20 heat exchange station to a common control platform and to bring them to a management station with remote access. Domat Control System won the tender and started to install new control systems at the plants in December 2009, with average pace of one or two plants per week. The network consists of wireless communication infrastructure with WiFi and Ethernet clients and four access points to connect all network nodes. Data from all nodes are permanently available at the management stations, trend data is stored into a SQL database which is also used by the customer for data export and additional calculations in an ERP software.

Strong impact was put to investment protection: all peripherials which were not damaged were also used in the new system, which was no problem thanks to the Domat I/O modules. The biomass burners were integrated over OPC, while some of the compact heating stations used BACnet / IP to communicate with the Domat SCADA. Heat and water meters are integrated over M-Bus converters into the process stations and then over the network into the management stations, too. All data from those heterogenous systems are brought to a common platform and are available for daily analysis and control. The management system consists of three workstations with RcWare Vision: two of them are at the main workplace for online monitoring and control and for long-term offline data analysis, and the third one is installed at the biomass burner site.

REFERENCES

References

Partner customers
Interspar a Spar (CZ, HU, SI, HR) - 70 sites
Objekty Billa (CZ, SK) - 29 sites
Family Centrum (CZ, SK) - 13 sites
Autosalony Porsche Interauto (CZ) - 7 sites
Baumax (CZ, SI, HR) - 7 sites
Linde - Carrier (CZ, SK) - integration of commercial refrigeration system, 16 sites

Shopping centers
Galerie Harfa
OAC Jeronýmova České Budějovice
Shopping Center Česká Lípa
BAUHAUS České Budějovice
Shopping Center Znojmo
OBI (6 hobbymarkets)
Hypernova Tábor
Autosalon TUkas Beroun
Marks & Spencer Praha-Chodov
Shopping Center Tábor
Shopping Center Mladá Boleslav
TESCO Revúca
Retail Park Radouč
Shopping Center Jablonec nad Nisou
Shopping Center Jičín
Shopping Center Semily

Office buildings, schools
City Center České Budějovice
Czech Radio Praha – Boiler house Dykova
NOELL Jesenice u Prahy – corporate HQ
Komerční banka Plzeň
Fintherm Praha
Česká spořitelna Liberec
Technopark Pardubice
Archiv Chrudim
Park House Sazka
Czech Technical University Prague
Training Center Rychnov nad Kněžnou
University Telč
Primary School Říčany

Hospitals, health care
Senior nursing home, Prague
Hospital Říčany
Rehab facility Brandýs nad Orlicí
Dialysis Martin (SK)

Sport facilities
Golf Resort Kunětická Hora
AC Sparta Praha
Winter stadium Humpolec

Industry
Olympus Winter & Ibe Přerov, clean rooms
VÚAB Roztoky, pharmaceutical production
CCCB-EON Customer Care Center
Iron and Wire Works Bohumín
CMI Hradec Králové - clean rooms
IBM - Technology Park Brno
Canning factory Hrobčice
Danone Benešov
Print shop Label Design, Chrášťany
LPA Lovosice
Swell Hořice
Pavex Pardubice
Koito Žatec

REFERENCES

Koito Žatec
Teluria Skrchov
Print shop Branaldi Brandýs nad Labem
Ammoniac gas recuperation, BorsodChem Ostrava
Wikov Hronov
Kasper Kovo Trutnov

Logistics
Airport Mošnov
GEMO Olomouc – Hněvotín
Logistic Park D8 – Hall DC04, Zdiby
Kovintrade storage facility, Frýdlant n. O.
Tulipán Park Hostivice

Energy production and distribution

Heating facilities
SPB Trenčín – district heating network
Heat Distribution Prachatice
Czech Post

Photovoltaic plants
PV Plant Ševětín, 30 MWp
PV Plant Klenovka, 8 MWp

PV Plant Tuřany, 7 MWp
PV Plant Vranovská Ves, 16 MWp
PV Plant CTP Brno, 5 MWp

PV Plant Dobré Pole, 18 MWp
Total more than 70 installations, 0.5 ... 30 MWp

Others
Fortell Lanškroun – load shedding
PV Plant Management Center Lumen
PV Plant Management Center Photon Energy
PV Plant Management Center Suntanzer

Residential objects

Hotels, lodging facilities
Hotel AVENA**** Liptovský Mikuláš
Hotel Palace ***** Praha
Art Hotel Embassy Praha
Hotel Bridge Praha
Brewery Hotel Kojetín
Brewery Restaurant, Krušovice
Casino Liberec

Residential houses
Family house Blato
Residential house Hvězda, Praha 6
Residential house Kováků, Praha 5
Family house Vrané nad Vltavou
Family house Hradešín
Family house Solopisky
Family house Zdiby
Residence Prokopova, Praha 3
Residential houses, Liberec – Jablonec n. N. – heat pumps

Selected references worldwide

IMPACT Kuala Lumpur, Malaysia
Hospital Luanda, Angola
City Center Zagreb (HR)
MOL refinery (HU)
Tesco (HU) - 5 sites, solar plants
Restaurant, Upper Austria (AT)
Residence, Ste. Maxime (FR)
Aeroporto de Leon - Repsol Aviation (PT)
Lab. Hidráulica DEC Universita Coimbra (PT)
Multifunctional school Arnhem (NL)
Vlaandingenweg – bio food plant, Arnhem (NL)
Office villas, Arnhem (NL)
Coal quality measurement, PPC Amindeo (GR)

PRODUCT OVERVIEW

I/O MODULES / PROCESS STATIONS / INTEGRATED ROOM CONTROL / SCADA / ENGINEERING TOOLS / PERIPHERIALS

HOW TO USE THE PRODUCT OVERVIEW

Each price list item contains Type identification which is used for ordering in the default configuration. This is detailed in the Brief description part. If the item has more configuration options, they are listed in the right column and each group of options is marked with an asterisk. Example: In case of the room combined sensor the default type RFTF-U provides one active 0..10 V temperature output, however, passive temperature sensors can be delivered instead, e.g. RFTF-U Pt1000. Another option are 4...20 mA outputs instead of the 0..10 V outputs. The sensor type ID is then RFTF-I and – as it is set in bold letters – the price is same as that of

the default type, RFTF-U. The type ID RFTF-I Ni1000-5000 then provides a 4...20 mA output for humidity, and Ni1000-5000 passive temperature sensor.

At each of the options, there may be a LCD display to display measured values, e.g. RFTF-U Pt1000 display. The prices of all basic types as well as options are listed in the Domat Control System price list or communicated upon request (customized cable lengths etc.).

All data are subject to changes.

Type ID	Brief description	Bold type identification = same price
RFTF-U	**Room humidity and temperature sensor** capacitive element, 40..60% rH: 3%, 10..90% rH: 5%, temperature 0..+50 °C, output 2 x 0..10V, power supply 24 V AC/DC, wall mounting, dimensions 79 x 81 x 26 mm	* outputs 4..20 mA RFTF-I * display * passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
Image	*Technical data subject to ordering code*	*Possible options, each marked with the * symbol. Their prices may differ from the prices of the basic type. See details in the price list.*

Type	Description	Options and comments

PROCESS STATIONS, CONTROLLERS
PROCESS STATIONS INCL. SOFTPLC RUNTIME

IPCB.1	**Process station / industrial PC** WinXP Embedded, CF 1GB, Atom 1.6 GHz, 1 GB RAM, 2x Ethernet, 3x RS232, VGA, 4x USB, audio, incl. power supply 230 / 12V	
IPCT.1	**Process station, touch screen 8"** WinXP Embedded, CF 1GB, Atom 1.6 GHz, 1 GB RAM, 2x Ethernet, 2x RS232, 4x USB, incl. power supply 230 / 12V	
IPLC201	**DDC controller MiniPLC - 1 serial port, display** Powerful PowerPC-based process station, Ethernet, RS485, display, buttons, web server, programming in SoftPLC IDE. Supply 10..35 V DC / 24 V AC DIN rail mounting, dimensions 90 x 58 x 105 mm	Use FRAME to install the controller into a front panel
IPLC301	**DDC controller MiniPLC - 4 serial ports, display** Powerful PowerPC-based process station, Ethernet, 2x RS485, 2x RS232, display, buttons, web server, programming in SoftPLC IDE. Supply 10..35 V DC / 24 V AC DIN rail mounting, dimensions 90 x 58 x 105 mm	Use FRAME to install the controller into a front panel

Type	Description	Options and comments
IPLC201B	**DDC controller MiniPLC - 1 serial port, no display** Powerful PowerPC-based process station, Ethernet, RS485, web server, programming in SoftPLC IDE. Supply 10..35 V DC / 24 V AC DIN rail mounting, dimensions 90 x 58 x 105 mm	Use FRAME to install the controller into a front panel
IPLC301B	**DDC controller MiniPLC - 4 serial ports, no display** Powerful PowerPC-based process station, Ethernet, 2x RS485, 2x RS232, web server, programming in SoftPLC IDE. Supply 10..35 V DC / 24 V AC DIN rail mounting, dimensions 90 x 58 x 105 mm	Use FRAME to install the controller into a front panel
IPLC500	**DDC controller MiniPLC Shark - 1 port, display** Powerful PowerPC-based process station with Linux, Ethernet, RS485, display, buttons, web, programming in SoftPLC IDE. Supply 10..35 V DC / 24 V AC DIN rail mounting, dimensions 90 x 58 x 105 mm	OS Linux / Mono. Use FRAME to install the controller into a front panel
IPLC510	**DDC controller MiniPLC Shark - 4 ports, display** Powerful PowerPC-based process station with Linux, Ethernet, 2x RS485, 2x RS232, display, buttons, web, programming in SoftPLC IDE. Supply 10..35 V DC / 24 V AC DIN rail mounting, dimensions 90 x 58 x 105 mm	OS Linux / Mono. Use FRAME to install the controller into a front panel
IPLC500B	**DDC controller MiniPLC Shark - 1 port, no display** Powerful PowerPC-based process station with Linux, Ethernet, RS485, web, programming in SoftPLC IDE. Supply 10..35 V DC / 24 V AC DIN rail mounting, dimensions 90 x 58 x 105 mm	OS Linux / Mono.
IPLC510B	**DDC controller MiniPLC Shark - 4 ports, no display** Powerful PowerPC-based process station with Linux, Ethernet, 2x RS485, 2x RS232, web, programming in SoftPLC IDE. Supply 10..35 V DC / 24 V AC DIN rail mounting, dimensions 90 x 58 x 105 mm	OS Linux / Mono.
MXPLC	**Combined I/O module, 88 I/O with MiniPLC board** I/O mix same as MXIO. Integrated MiniPLC control board. Dimensions 265 x 292 x 40 mm, supply 10..35 V DC / 24 V AC, 2x RS232, 2x RS485 galv. separated, Ethernet, web server	MXIO see in the I/O modules and convertors section

PROCESS STATIONS WITH NO OS / RUNTIME OR WITH WINDOWS CE

IPC05105T	**Process station 5,7" LCD touch screen** 640x480, 220 cd/m2, Atom 1.6 GHz, 1GB, 2x Ethernet, 2x RS232, 4x USB, CF slot, 12..24 V DC, IP65	
IPC08105T	**Process station 8" LCD touch screen** 800x600, 400 cd/m2, Atom 1.6 GHz, 1GB, 2x Ethernet, 2x RS232, 4x USB, CF slot, 12..24 V DC, IP65	
IPC10105T	**Process station 10,4" LCD touch screen** 800x600, 250 cd/m2, Atom 1.6 GHz, 1GB, 2x Ethernet, 2x RS232, 2x USB, CF slot, 12..24 V DC, IP65	
IPC12105T	**Process station 12,1" LCD touch screen** 800x600, 300 cd/m2, Atom 1.6 GHz, 1GB, 2x Ethernet, 2x RS232, 4x USB, CF slot, 12..24 V DC, IP65	
IPC12105HT	**Process station 12,1" LCD touch screen** 1024x768, 300 cd/m2, Atom 1.6 GHz, 1GB, 2x Ethernet, 2x RS232, 4x USB, CF slot, 12..24 V DC, IP65	
IPC15105HT	**Process station 15" LCD touch screen** 1024x768, 300 cd/m2, Atom 1.6 GHz, 1GB, 2x Ethernet, 2x RS232, 4x USB, CF slot, 12..24 V DC, IP65	

Type	Description	Options and comments
IPC08110T	Process station 8" LCD touch screen 800x600, 400 cd/m2, Celeron M 600MHz, 512MB, 2xRS232, Ethernet, USB, audio, 2xPS/2, ext.VGA, HDD + CF slot, 12..24 V DC, IP65	
IPC10110T	Process station 10,4" LCD touch screen 800x600, 250 cd/m2, Celeron M 1.5GHz, 512MB, 2xCOM, Ethernet, USB, audio, 2xPS/2, ext.VGA, HDD / CF slot, 12..24 V DC, IP65	
IPC12110T	Process station 12,1" LCD touch screen 800x600, 300 cd/m2, Celeron M 1.5GHz, 512MB, 2xCOM, Ethernet, USB, audio, 2xPS/2, ext.VGA, HDD / CF slot, 12..24 V DC, IP65	
IPC12110HT	Process station 12,1" LCD touch screen 1024x768, 300 cd/m2, Celeron M 1.5GHz, 512MB, 2xCOM, Ethernet, USB, audio, 2xPS/2, ext.VGA, HDD / CF slot, 12..24 V DC, IP65	
IPC15110T	Process station 15" LCD touch screen 1024x768, 400 cd/m2, Celeron M 1.5GHz, 512MB, 2xCOM, Ethernet, USB, audio, 2xPS/2, ext.VGA, HDD / CF slot, 12..24 V DC, IP65	
IPC17110T	Process station 17" LCD touch screen 1280x1024, 300 cd/m2, Al frame, Celeron M 1.5GHz, 512MB, 2xCOM, Ethernet, USB, audio, 2xPS/2, ext.VGA, HDD / CF slot, 12..24 V DC, IP65	
IPC19110T	Process station 19" LCD touch screen 1280x1024, 300 cd/m2, Al frame, Celeron M 1.5GHz, 512MB, 2xCOM, Ethernet, USB, audio, 2xPS/2, ext.VGA, HDD / CF slot, 12..24 V DC, IP65	
IRISC08010T	Process station 8" LCD touch screen, Win CE 800x600, 400 cd/m2, Intel PXA255 400MHz, 128MB RAM, 32MB Flash, 1MB SRAM battery backup, 2xCOM, Ethernet, 1x USB host, 1x USB client, audio, ext. VGA, 2xPS/2, CF slot, 12..24 V DC, IP65, Windows CE	
IRISC10010T	Process station 10,4" LCD touch screen, Win CE 800x600, 250 cd/m2, Intel PXA255 400MHz, 128MB RAM, 32MB Flash, 1MB SRAM battery backup, 2xCOM, Ethernet, 1x USB host, 1x USB client, audio, ext. VGA, 2xPS/2, CF slot, 12..24 V DC, IP65, Windows CE	
IRISC12010T	Process station 12.1" LCD touch screen, Win CE 800x600, 300 cd/m2, Intel PXA255 400MHz, 128MB RAM, 32MB Flash, 1MB SRAM battery backup, 2xCOM, Ethernet, 1x USB host, 1x USB client, audio, ext. VGA, 2xPS/2, CF slot, 12..24 V DC, IP65, Windows CE	
IRISC12010HT	Process station 12.1" LCD touch screen, Win CE 1024x768, 300 cd/m2, Intel PXA255 400MHz, 128MB RAM, 32MB Flash, 1MB SRAM battery backup, 2xCOM, Ethernet, 1x USB host, 1x USB client, audio, ext. VGA, 2xPS/2, CF slot, 12..24 V DC, IP65, Windows CE	
IRISC15010T	Process station 15" LCD touch screen, Win CE 1024x768, 400 cd/m2, Intel PXA255 400MHz, 128MB RAM, 32MB Flash, 1MB SRAM battery backup, 2xCOM, Ethernet, 1x USB host, 1x USB client, audio, ext. VGA, 2xPS/2, CF slot, 12..24 V DC, IP65, Windows CE	
IRISC05011T	Process station 5,7" LCD touch screen, Win CE 320x240, 500 cd/m2, Samsung ARM9 203MHz, 64MB RAM, 64MB Flash, 2xCOM, Ethernet, 1x USB host, 1x USB client, 24 V DC, IP65, Windows CE	
IPC00100	Process station / industrial PC Atom 1.6 GHz, 1GB, 3xCOM, VGA, Ethernet, 4xUSB, 12..24 V DC, CF or 2.5" HDD frame	
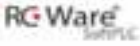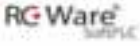
Type		Description	Options and comments
IPC00110		Process station / industrial PC Pentium M 1.8GHz, 512MB, 2xCOM, ext.DVI, ext.VGA, 2xUSB, Ethernet, audio, 2xPS/2, 12..24 V DC, CF or 2.5" HDD frame	
IPC00111		Process station / industrial PC Pentium M 1.8GHz, 512MB, 1x ext.PCI, 3xCOM, ext.DVI, ext. VGA, 4xUSB, 2xEthernet, audio, 2xPS/2, 12..24 V DC, CF or 2.5" HDD frame	

TOUCH SCREENS

Type		Description	Options and comments
LCD08000PT		Touch screen display 8" 8" LCD, 800x600, VGA, 400cd/m2, 12V DC, IP 65, OSD at rear, plastic frame	
LCD10000M		Touch screen display 10,4" 10,4" LCD, 800x600, VGA, 400cd/m2, 12V DC, IP 65, OSD at rear, plastic frame	
LCD10000PT		Touch screen display 10,4" 10,4" LCD, 800x600, 400cd/m2, 12V DC, IP 65, OSD at rear, plastic frame	
LCD12000M		Touch screen display 12,1" 12,1"LCD, 800x600 (640x480 to 1600x1200), VGA (optionally DVI, S-Video) 300cd/m2, 100 to 240V AC, IP 65, OSD at rear, steel frame	
LCD12000PT		Touch screen display 12,1" 12,1"LCD, 800x600 (640x480 to 1600x1200), VGA (optionally DVI, S-Video) 300Cd/m2, 100 to 240V AC, IP 65, OSD at rear, plastic frame	
LCD15000M		LCD display 15", steel frame 15"LCD, 1024x768 (640x480 až 1600x1200), VGA (optionally DVI, S-Video) 400cd/m2, 100 to 240V AC / DC, IP 65, OSD at rear, steel frame	For touch screen functionality, add TOUCH15
LCD15000A		LCD display 15", aluminium frame 15"LCD, 1024x768 (640x480 to 1600x1200), VGA (optionally DVI, S-Video) 400cd/m2, 100 to 240V AC, IP 65, OSD at front, aluminium frame	For touch screen functionality, add TOUCH15
LCD15000AW		LCD display 15", aluminium frame, wide angle 15" LCD, wide viewing angle, 1024x768 (640x480 to 1600x1200), VGA (optionally DVI, S-Video) 450cd/m2, 100 to 240V AC (optionally DC), IP 65, OSD at front, aluminium frame	For touch screen functionality, add TOUCH15
LCD17000M		LCD display 17", steel frame 17"LCD, 1280x1024 (640x480 to 1600x1200), VGA (optionally DVI, S-Video) 300cd/m2, 100 to 240V AC, IP 65, OSD at rear, steel frame	For touch screen functionality, add TOUCH17
LCD17000A		LCD display 17", aluminium frame 17"LCD, 1280x1024 (640x480 to 1600x1200), VGA (optional DVI, S-Video) 250cd/m2, 100 to 240V AC (optionally DC), IP 65, OSD at front, aluminium frame	For touch screen functionality, add TOUCH17
LCD17000SRAT		LCD display 17", readable in direct sunlight 17"LCD SUNLIGHT READABLE, 1280x1024 (640x480 to 1600x1200), VGA (optionally DVI, S-Video) 250cd/m2, 100 to 240V AC / DC, IP 65, OSD at front, aluminium frame	For touch screen functionality, add TOUCH17

Type	Description	Options and comments
LCD19000A	**LCD display 19", aluminium frame** 19" LCD, 1280x1024 (640x480 to 1600x1200), VGA (optionally DVI, S-Video) 420cd/m2, 100 to 240V AC (optionally DC), IP 65, OSD at front, aluminium frame	For touch screen functionality, add TOUCH19
TOUCH15	**15" touch screen with frame** Resistive touch screen 15", add-on for LCD15...	
TOUCH17	**17" touch screen with frame** Resistive touch screen 17", add-on for LCD17...	
TOUCH19	**19" touch screen with frame** Resistive touch screen 19", add-on for LCD19...	

SOFTWARE FOR PROCESS STATIONS

RC-SoftPLC	**Runtime RcWare SoftPLC** for OS Windows 2000 / XP / Vista, incl. all available communication drivers. Includes other programs such as HMI runtime (touchscreen application), HMI editor, OPC server, Modbus RTU server etc.	SoftPLC Runtime running on 3rd party PCs (servers etc.) Licence code bounds to the particular hardware and must be activated at https://licenses.rcware.eu
RC-SoftPLC Proxy	**Proxy service for remote access to runtime** to reach runtimes at customers' sites running behind NAT or with no public / fixed IP address over outgoing HTTP connection from the runtime to the Domat proxy server.	One-year service subscription.
RC-SoftPLC Weather	**Weather forecast service** Runtime reads weather forecast data (max., min temp., wind speed & direction, precipitations) for a defined geographic position and time over the internet. The data is used to optimize floor heating, cold water accumulation etc.	One-year service subscription.

PROCESS STATIONS ACCESSORIES

WinXPE	**Windows XP Embedded** OS Windows XP Embedded build for IPC.... process stations. Delivered at CF1GB card, which has to be ordered separately.	Deliveries depend on availability and conditions of Microsoft.
WinXPH	**Windows XP Home** Installation CD and licence of Windows XP Home operating system	Deliveries depend on availability and conditions of Microsoft.
WinXPP	**Windows XP Professional** Installation CD and licence of Windows XP Professional operating system	Deliveries depend on availability and conditions of Microsoft.
HDDCF	**HDD/CF frame** Connects a CF card to Mini IDE interface	
CF512	**CF card 512MB** For data storage at process stations with 2xCF slot	

Type	Description	Options and comments
TOUCH8	**8" touch panel with frame - Repair kit** Spare part for the 8" process station if the touch screen is damaged	
HDD40	**Hard disk 40GB** Optional 2.5", 40GB hard disk for process stations	
CF1GB	**CF Card 1 GB, Industrial** CF card CF 1 GB Industrial, split into 2 drives: 700 MB (operating system) and 300 MB (data)	
HWS	**Hardware protection key** Option for temporary installation of SoftPLC (trainings, demos etc.). Plugs into a COM port of the process station, fully transparent for serial communication.	The SoftPLC runtime licence must be ordered separately. HWS is an alternative to the standard software licencing process.
FRAME	**Mounting frame for MiniPLC** For fixing of the MiniPLC into front panel: cut a 106 x 46 mm aperture and two holes for the screws in the front door, then use a 150 mm DIN rail to mount the MiniPLC from inside. The frame covers the aperture on the outer side.	

INTEGRATED ROOM CONTROL

Type	Description	Options and comments
UC100	**Heating controller, communicative** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, change-over, status indication and switching, 1x DO (24 V AC radiator), Modbus / RS485 galv. separated	
UC200	**Heating/cooling controller, communicative** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, real time clock, status indication and switching, 2x DI (presence, window), 2x DO (24 V AC radiator, cooling panel), Modbus / RS485 galv. separated	
UC300	**Floor heating controller, communicative** Display 60 x 60 mm, push / turn knob, temperature sensor, 1x AI for ext. Pt1000 floor sensor, setting of values, real time clock, status indication and switching, 1x DO (24 V AC thermic actuator), Modbus / RS485 galv. separated	
UC120	**Heating controller 0..10 V, communicative** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, change-over, status indication and switching, 1x AO (0..10 V DC), Modbus / RS485 galv. separated	
UC220	**Heating/cooling controller 0..10 V, communicative** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, real time clock, status indication and switching, 2x DI (presence, window), 2x AO (0..10 V DC radiator, cooling panel), Modbus / RS485 galv. separated	
UC010	**Room unit, communicative** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of operation mode, fancoil stages and setpoints, status indication and switching, Modbus / RS485 communication	Room unit with firmware for communication with FC010 / FC020 fan coil controller UC010/DK: no display, no knob (for schools, corridors etc.)
UC011	**Room unit, communicative** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of operation mode, fancoil stages and setpoints, status indication and switching, Modbus / RS485 galv. separated	Room unit with firmware for communication with FC010 / FC020 fan coil controller
FC010	**Fan coil controller, communicative** 2 x DI (presence, window), 2 x DO triac 24...230 V AC for thermic valves (heating, cooling) , 3 x relay for three-stage fancoil, 1x Modbus slave / RS485 for SCADA/primary controller, 1x Modbus master / RS485 for UC010	Use UC010 or galvanically separated UC011 as room unit.

Type		Description	Options and comments
FC020		**Fan coil controller, communicative** 4 x AI (Pt1000 or potentiometer), 4 x DI, 2 x AO 0..10V, 7 x DO triac 24...230 V AC for thermic or 3-point valves (heating, cooling) and 3-stage fancoil, communication same as FC010, analogue or UC010 room unit possible	Use RTF.. (analogue unit) or UC01x (communicative unit) as room unit.
UCWEB		**Web interface for room controllers** 2 x DI (enable / alarm), 2 x DO relay 24...230 V, 5 A (heat/cool demand / remote), Ethernet, Modbus / RS485 for up to 20 UC100/200/300, autoconfiguration, web access to controller settings and values	
UC150		**Heating controller, Ethernet** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, 1x DO (24 V AC thermic valve), web access, Modbus / TCP	
UC250		**Heating and cooling controller, Ethernet** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, real time clock, status indication and switching, 2x DI (presence, window), 2x DO (24 V AC radiator, cooling panel), web access, Modbus / TCP	
US100		**Heating controller, communicative, blinds control** Display 60 x 60 mm, 5x button, temperature sensor, setting of values, status indication and switching, 3x DO (24 V AC radiator, Blinds up, Blinds down), Modbus / RS485 communication	

COMMUNICATIVE ROOM UNITS AND SENSORS

UI010		**Room unit, RS485, temperature** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, Modbus / RS485 communication	
UI011		**Room unit, RS485, temperature** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, Modbus / RS485 communication galv. separated	* no knob - UI051, no knob / display - UI071
UI012		**Room unit, RS485, temperature, 1DO** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, Modbus / RS485 galv. separated, 1xDO triac 24 V AC	* no knob - UI052, no knob / display - UI072
UI020		**Room unit, RS485, t, 2DI, 2DO** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 2xDI, 2xDO triac 24 V AC	* no knob - UI055, no knob / display - UI075
UI041		**Room unit, RS485, temperature, rH** Display 60 x 60 mm, push / turn knob, temperature / humidity sensor, setting of values, status indication and switching, Modbus / RS485 communication galv. separated	* no knob - UI061, no knob / display - UI081
UI042		**Room unit, RS485, temperature, rH, 1DO** Display 60 x 60 mm, push / turn knob, temperature / humidity sensor, setting of values, status indication and switching, Modbus / RS485 galv. separated, 1xDO triac 24 V AC	* no knob - UI062, no knob / display - UI082
UI045		**Room unit, RS485, t, rH, 2DI, 2DO** Display 60 x 60 mm, push / turn knob, temperature / humidity sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 2xDI, 2xDO triac 24 V AC	* no knob - UI065, no knob / display - UI085
UI511		**Room unit, Ethernet, temperature** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, Modbus / TCP	* no knob - UI551, no knob / display - UI571

Type		Description	Options and comments
UI512		**Room unit, Ethernet, temperature, 1DO** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, Modbus / TCP, 1xDO triac 24 V AC	* no knob - UI552, no knob / display - UI572
UI520		**Room unit, Ethernet, t, 2DI, 2DO** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, real time clock, status indication and switching, Modbus / TCP, 2xDI, 2xDO triac 24 V AC	* no knob - UI555, no knob / display - UI575
UI541		**Room unit, Ethernet, temperature, rH** Display 60 x 60 mm, push / turn knob, temperature / humidity sensor, setting of values, status indication and switching, Modbus / TCP	* no knob - UI561, no knob / display - UI581
UI542		**Room unit, Ethernet, temperature, rH, 1DO** Display 60 x 60 mm, push / turn knob, temperature / humidity sensor, setting of values, status indication and switching, Modbus / TCP, 1xDO triac 24 V AC	* no knob - UI562, no knob / display - UI582
UI545		**Room unit, Ethernet, t, rH, 2DI, 2DO** Display 60 x 60 mm, push / turn knob, temperature / humidity sensor, setting of values, real time clock, status indication and switching, Modbus / TCP, 2xDI, 2xDO triac 24 V AC	* no knob - UI565, no knob / display - UI585
UI611		**Room unit, Ethernet, PoE, temperature** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, Modbus / TCP. Powered over Ethernet.	* no knob - UI651, no knob / display - UI671
UI612		**Room unit, Ethernet, PoE, temperature, 1DO** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, Modbus / TCP, 1xDO SSR 24 V AC/DC. Powered over Ethernet.	* no knob - UI652, no knob / display - UI672
UI620		**Room unit, Ethernet, PoE, t, 2DI, 2DO** Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, real time clock, status indication and switching, Modbus / TCP, 2xDI, 2xDO SSR 24 V AC/DC. Powered over Ethernet.	* no knob - UI655, no knob / display - UI675
UI641		**Room unit, Ethernet, PoE, temperature, rH** Display 60 x 60 mm, push / turn knob, temperature / humidity sensor, setting of values, status indication and switching, Modbus / TCP. Powered over Ethernet.	* no knob - UI661, no knob / display - UI681
UI642		**Room unit, Ethernet, PoE, temperature, rH, 1DO** Display 60 x 60 mm, push / turn knob, temperature / humidity sensor, setting of values, status indication and switching, Modbus / TCP, 1xDO SSR 24 V AC/DC. Powered over Ethernet.	* no knob - UI662, no knob / display - UI682
UI645		**Room unit, Ethernet, PoE, t, rH, 2DI, 2DO** Display 60 x 60 mm, push / turn knob, temperature / humidity sensor, setting of values, real time clock, status indication and switching, Modbus / TCP, 2xDI, 2xDO SSR 24 V AC/DC. Powered over Ethernet.	* no knob - UI665, no knob / display - UI685
UI410		**Measuring and signalling module** 1x DI dry contact, 1x AI for ext. Pt1000 sensor, 1xDO triac 24 V AC / 0.5 A, 1x high intensity LED, 1x horn, Modbus / RS485 galv. separated. Power 10..35 V DC, 12..24 V AC	To be integrated in a SoftPLC process station, MyIO over www.myio.info, or any PLC or SCADA.
UX011		**Room unit, RS485, temperature** Display 60 x 60 mm, 5x button, temperature sensor, setting of values, status indication and switching, 1xDI, 3x DO (triac), Modbus / RS485 communication galv. separated	* real time clock - UX015
UX041		**Room unit, RS485, temperature, rH** Display 60 x 60 mm, 5x button, temperature and humidity sensor, setting of values, status indication and switching, 1xDI, 3x DO (triac), Modbus / RS485 communication galv. separated	* real time clock - UX045

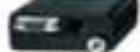| Type	Description	Options and comments

MANAGEMENT STATIONS / PC

| PCD1 | **Management station PC** Configuration for RcWare Vision, HDD 500GB, LCD 17", colour printer, keyboard, mouse, OS. | |

MANAGEMENT STATIONS / RCWARE VISION - SCADA SOFTWARE

RC-Vision	**RcWare Vision - SCADA** Licence for SCADA system, max. 4500 data points, alarming, trends, events, web access, SMS, drivers for Domat SoftPLC (see www.rcware.eu).	Multilicensing (more management stations at one site): 2nd = -30%, 3rd = -50%, 4th = -70%
RC-Vision-x	**RcWare Vision - SCADA unlimited data points** Licence for SCADA system, unlimited number of data points, alarming, trends, events, web access, SMS, drivers for more than 40 PLC / PAC systems (see www.rcware.eu).	Multilicensing (more management stations at one site): 2nd = -30%, 3rd = -50%, 4th = -70%
RcWare DB	**RcWare DB connector for SQL database** Module for SQL connectivity and trend data storage. Use where Vision has to share trend data with a 3rd party applications or store them in a SQL database (MS SQL, MySQL, Postgres etc.).	If this module is not installed the trend data is stored in proprietary data files. All trend functions are fully available even without the SQL extension.

MANAGEMENT STATIONS / ACCESSORIES

DC-PDA	**PDA with touchscreen application** To access process data and control a SoftPLC application over WiFi, incl. graphics software runtime.	
DC-NHU8	**Ethernet switch 8 ports, 10/100** Switch for connection of process stations and web controllers to the management station.	
DC-NAP	**WiFi wireless access point** WiFi access point 802.11b/g for connection of a PDA or Panel PC, power supply.	
GSM	**GSM modem** GSM / RS232, for alarm SMS messages from RcWare Vision or MiniPLC / process station with SoftPLC runtime. SIM card is not part of delivery.	Inclusive power supply, 35 cm antenna, and CANNON 9 cable for connection to a PC or IPLC301 / 510.
GPRS	**GPRS router** GSM / Ethernet. For alarm mailing / remote access over a GPRS network. SIM card with GPRS data service is not part of delivery.	Inclusive power supply, antenna, and Ethernet cable.

I/O MODULES AND CONVERTORS / I/O MODULES AND CONVERTORS

MCIO2	**Combined I/O module, 30 I/O** 8AI (0..10V, Pt100, Pt1000, Ni1000, T1), 6AO (0..10V), 8DI (24V), 8DO (230V/5A), DIN rail mounting, dimensions 217 x 115 x 40 mm, supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	Replacement of MCIO. The new module features 6x AO instead of 5, and galv. separation of AI and AO grounds.
ECIO2	**Combined I/O module, 30 I/O, Ethernet** 8AI (0..10V, Pt100, Pt1000, Ni1000, T1), 6AO (0..10V), 8DI (24V), 8DO (230V/5A), DIN rail mounting, dimensions 217 x 115 x 40 mm, supply 10..35 V DC / 24 V AC, Modbus TCP and RTU / RS485 galv. separated	Modbus TCP / RTU routing function: connect more I/O modules to the RS485 bus and access them over the Ethernet - Modbus TCP.
MMIO	**Combined I/O module, 17 I/O** 4 x AI (Pt1000 or potentiometer, 2x 0..10 V), 4 x DI dry contact, 2 x AO 0..10V, 7 x DO triac 24...230 V AC. DIN rail mounting, dimensions 90 x 105 x 58 mm, supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	

Type	Description	Options and comments
MXIO	**Combined I/O module, 88 I/O** 16 x AI (0..10V, Pt100, Pt1000, Ni1000, T1) galv. sep., 32 x DI 24 V, 8 x AO 0..10V galv. sep., 32 x DO relay 24...230 V AC / 5A. Dimensions 265 x 292 x 40 mm, supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	See also MXPLC in the *Process stations* section
M200	**4 relays output module** max. 8 A / 250 V AC or 8A / 24 V DC, DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	* Advantech communication protocol - M200/A
M210	**8 relays output module** max. 8 A / 250 V AC or 8A / 24 V DC, DIN rail mounting, dimensions 90 x 105 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	
M215	**8 relays output module, manual override** max. 8 A / 250 V AC or 8A / 24 V DC, manual override by front panel buttons. DIN rail mounting, dimensions 90 x 105 x 58 mm. Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	
M300	**8 digital outputs module** open collector, 50 V DC, 0.5 A DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	* Advantech communication protocol - M300/A
M312	**8 triac outputs module** To control 8 groups of thermic actuators 230 or 24 V, output current max. 0.5 A per output. DIN rail or 2 screws mounting, dimensions 113 x 90 x 24 mm. Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	If there are more than 2 actuators in a group at 24 V AC use triac amplifiers ME210, ME220.
M320	**16 digital outputs module** open collector, 50 V DC, 0.5 A DIN rail mounting, dimensions 90 x 105 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	
M325	**16 digital outputs module, manual override** open collector, 50 V DC, 0.5 A, manual override by front panel buttons. DIN rail mounting, dimensions 90 x 105 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	
M400	**8 digital inputs module 24 V** 24 V AC/DC, 15 mA, common grounds by pairs DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	* Advantech communication protocol - M400/A
M401	**8 digital inputs module 24 V** 24 V AC/DC, 15 mA, common ground for all inputs DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	* Advantech communication protocol - M401/A
M410	**8 digital inputs module 230 V** 230 V AC/DC, 10 mA, common grounds by pairs DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	* Advantech communication protocol - M410/A
M411	**8 digital inputs module 230 V** 230 V AC/DC, 10 mA, common grounds for all inputs DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	* Advantech communication protocol - M411/A
M420	**16 digital inputs module 24 V** 24 V AC/DC, 15 mA, common ground for each 8 inputs DIN rail mounting, dimensions 90 x 105 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	
M500	**8 analogue inputs module 0..10V** separated from power and comm. parts, 16 bit A/D converter, DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	

Type	Description	Options and comments
M550	**8 analogue inputs module, passive** Ni1000, Pt100, Pt1000, 20..1600 Ohm, 16 bit DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	
M600	**Analogue output module** 0..10V or 0(4)..20 mA, optically separated DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	* Advantech communication protocol - M600/A
M610	**8 analogue outputs module** 0..10V, 10 mA, optically separated, common ground DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	* Advantech communication protocol - M610/A
M620	**4 analogue outputs module** 4...20 mA, each output optically separated DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	
M700	**2 pulse counters module, battery backup** for dry contacts / OC (5 or 12V, 15 mA), 4 byte DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	* Advantech communication protocol - M700/A, 2 byte counter Specify M700/24V if 24 V open collector necessary
M710	**4 pulse counters module, battery backup** for dry contacts / OC (5 or 12V, 15 mA), 4 byte DIN rail mounting, dimensions 90 x 71 x 58 mm Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	Specify M710/24V if 24 V open collector necessary
MW240	**Control module for 2 lighting groups** 2x DI for dry contacts (switches or buttons), 2x DO relay 230 V AC / 5 A ohmic load. Flush box mounting, dimensions 49 x 49 x 30 mm. Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated	

I/O MODULES AND CONVERTORS / COMMUNICATION CONVERTERS

M012	**RS232 / RS485 converter** 1200..19200 bit/s, bus termination switch, optical separation, Rx, Tx, Power LEDs Supply 10..35 V DC / 24 V AC DIN rail mounting, dimensions 90 x 58 x 35 mm	Replacement of M011, now 3-way optical separation of RS232, RS485, and the power part
M020	**RS232 / Ethernet converter** Terminal server up to 230400 bit/s or 5x I/O + RxD,TxD, modem emulation, serial bridge. COM port driver for Windows and Linux. Supply 10..35 V DC / 24 V AC. DIN rail mounting, dimensions 90 x 58 x 35 mm	
M025	**RS232 / Ethernet converter, Modbus router** Same as M020, firmware extended by Modbus RTU / TCP routing functionality. Supply 10..35 V DC / 24 V AC. DIN rail mounting, dimensions 90 x 58 x 35 mm	
M031	**RS485 / Ethernet converter** Terminal server, up to 230400 bit/s. COM port driver for Windows and Linux. Supply 10..35 V DC / 24 V AC. DIN rail mounting, dimensions 90 x 58 x 35 mm	
M035	**RS485 / Ethernet converter, Modbus router** Same as M031, firmware extended by Modbus RTU / TCP routing functionality. Supply 10..35 V DC / 24 V AC. DIN rail mounting, dimensions 90 x 58 x 35 mm	
M036	**Modbus RTU / RS485 to Modbus TCP router** Only Modbus RTU / TCP routing functionality, no terminal server (as in M035). Supply 10..35 V DC / 24 V AC. DIN rail mounting, dimensions 90 x 58 x 35 mm	

Type	Description	Options and comments
M040	**RS232 / WiFi converter** Terminal server, up to 230400 bit/s. COM port driver for Windows and Linux. WiFi client, WAP, WPA, configuration over web. Supply 10..35 V DC / 24 V AC. DIN rail mounting, dimensions 90 x 58 x 35 mm	
M050	**RS485 / WiFi converter** Terminal server, up to 230400 bit/s. COM port driver for Windows and Linux. WiFi client, WAP, WPA, configuration over web. Supply 10..35 V DC / 24 V AC. DIN rail mounting, dimensions 90 x 58 x 35 mm	
MYIO	**Web communicator** 2 DI, 2 DO (expandable) controlled over web. Communication from behind NAT, Internet remote access. Ethernet, RS232/485, incl. power supply 230 / 12 V	See more at www.myio.info
M095	**M-Bus / RS232 converter, 26 devices** Supply 20...24 V DC, 14...24 V AC, max. 26 M-Bus meters, short-circuit protection, incl. driver for SoftPLC and 1.5 m RS232 cable with CANNON 9 connector. DIN rail mounting, dimensions 90 x 71 x 58 mm	
M096	**M-Bus / RS232 converter, 60 devices** Supply 20...24 V DC, 14...24 V AC, max. 60 M-Bus meters, short-circuit protection, incl. driver for SoftPLC and 1.5 m RS232 cable with CANNON 9 connector. DIN rail mounting, dimensions 90 x 71 x 58 mm	
M080	**USB / RS485 converter** Small and handy USB powered converter for service and commissioning. Optically separated, 3x LED (PC link, Rx, Tx). Inclusive driver and comfortable universal Modbus RTU / TCP client SW. 49 x 34 x 20 mm, USB cable 140 cm.	The client software domat.exe and M080 USB drivers are available at www.rcware.eu.

I/O MODULES AND CONVERTORS / DISPLAY UNITS, ACCESSORIES

HT100	**SoftPLC operator unit** LCD display 4 x 20 characters, 6 pushbuttons, for multiple SoftPLC runtimes (IPLC / IPCT / ...), communication over Ethernet, power supply 10..35 V DC / 24 V AC. Panel mounting, IP65, dimensions 175 x 105 x 40 mm	* HT110 Modbus TCP instead of SoftPLC protocol as option
MTala010	**Alarm panel** 6 LEDs, alarm horn, acknowledge button, Modbus RTU / RS485 Supply 10..35 V DC / 24 V AC. DIN rail mounting, dimensions 90 x 71 x 58 mm	
PWR010	**Transformer 230 / 24 V** Safety transformer 10 VA, installation to a flat surface with 2 screws.	
PWR011	**Transformer 230 / 24 V, 2x triac** Safety transformer 10 VA, installation to a flat surface with 2 screws. On-board are 2x 230V / 0,5 A triacs controlled by external 24 V AC signal for separation and pull-up of 2 PWM signals.	
ME200	**Power relay module** For connecting of the UX... room unit to the blinds controller. 2x relay 250 V / 8 A. Mounts in a flush box. Dimensions: 49 x 49 x 30 mm.	
ME210	**Triac amplifier** To connect more actuators to UC..., FC..., and UI.... Provides 1x triac output 24 V / 2 A. Flush box mounting, dimensions 49 x 49 x 14 mm.	Up to 4 thermic actuators may be connected to the output.
ME220	**Triac amplifier, 2 triacs** To connect more actuators to UC..., FC..., and UI.... Provides 2x triac output 24 V / 2 A. Each output may be controlled separately. Flush box mounting, dimensions 49 x 49 x 14 mm.	Up to 4 thermic actuators may be connected to each of the outputs. If IN1 and IN2 inputs are connected in parallel, ME220 may control up to 8 valves with one signal.

Type	Description	Options and comments

PERIPHERIALS / PASSIVE TEMPERATURE SENSORS

Type	Description	Options and comments
UT001	**Room temperature sensor** Wall-mounted, dimensions 90 x 107 x 26 mm Measuring element Pt1000	
UT051	**Outside temperature sensor** Wall-mounted, dimensions 90 x 107 x 26 mm, -20...70 °C, IP 43 Measuring element Pt1000	
RTF1	**Room temperature sensor** Wall-mounted, dimensions 79 x 81 x 26 mm Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
ALTF1	**Strap-on temperature sensor** -35...105 °C, IP54, dimensions 6 x 50 mm, contact metal sheet Strap band 300 mm, for pipes 13...92 mm Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * silicon cable - up to +180°C
ALTF2	**Strap-on temperature sensor** -30...110 °C, IP65, dimensions 72 x 64 x 39,4 mm Strap-on metal band 300 mm, for pipes 13...92 mm Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
ETF1	**Immersion temperature sensor** -30...150 °C, dimensions 72 x 64 x 39,4 mm + pocket Brass nickel-plated pocket 1/2", 150 mm, 10 bar Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * pockets 50, 100, 150, 200, 250, 300, 400 mm
ETF2	**Immersion temperature sensor** -30...150 °C, dimensions 72 x 64 x 39,4 mm + pocket Stainless steel pocket 1/2", 150 mm, 40 bar Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * pockets 50, 100, 150, 200, 250, 300, 400 mm
ATF1	**Outside temperature sensor** -50...90 °C, dimensions 72 x 64 x 39,4 mm Wall-mounted, IP65 Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
ATF2	**Outside temperature sensor** -50...90 °C, dimensions 72 x 64 x 39,4 mm Wall-mounted, sensor in external stainless steel pocket, IP65. Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
OFTF	**Surface temperature sensor** -30...105 °C, dimensions 8 x 8 x 40 mm + cable 1,5 m Aluminium housing, IP54 Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * cable length on demand * IP65
KTF1	**Duct temperature sensor** -30...150 °C, dimensions 72 x 64 x 39,4 mm + stem Stainless protective tube 6 x 150 mm, IP65 Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * stem length 50, 100, 150, 200, 250, 300, 400 mm
DTF	**Ceiling built-in sensor** -20...90 °C, dimensions 22 x 25 mm Installation in walls and ceilings, cutout 26 mm Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
ESTF	**Screw-in temperature sensor** -35...105 °C, dimensions 8 x 50 mm stainless steel 1/2", 40 bar, IP65, cable 1.5 m Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * silicone cable: -50...+180°C

Type		Description	Options and comments
MWTF		Mean value temperature sensor -30...80 °C, dimensions 72 x 64 x 39,4 mm + stem 400 mm Copper plastic-coated stem 6 x 150 mm, IP65 Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * length 0.4, 3, 6 m or customized up to 20 m
HTF		Cable temperature sensor -35...105 °C, dimensions 6 x 50 mm + cable 1,5 m Stainless steel tube, IP54 Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * silicone up to 180 °C, teflon up to 250 °C, length on request * IP65, IP68
RPTF1		Pendulum room temperature sensor -30...75 °C, dimensions 15 x 100 mm + cable 1,5 m Stainless steel tube, IP65 Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * cable length 3 m, 6 m or customized
RPTF2		Pendulum room temperature sensor -30...75 °C, plastic globe 50 mm, cable 1,5 m For air temperature and radiating temperature metering Measuring element Pt1000, IP65	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * cable length 3 m, 6 m or customized
ASTF		Wall temperature sensor (semi-global sensor) -30...75 °C, dimensions 72 x 64 x 53,4, plastic globe For air temperature and radiating temperature metering Measuring element Pt1000, IP65	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
RSTF		Room radiation temperature sensor (semi-global) -30...75 °C, plastic globe For air temperature and radiating temperature metering Measuring element Pt1000, IP30	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm

PERIPHERIALS / ACTIVE TEMPERATURE SENSORS

ALTM1		Strap-on temperature sensor -30…70 °C, dimensions 72 x 64 x 39,4 mm Strap band 300 mm, tube diameter 13...92 mm Output 0..10V, power supply 24 V DC	* output 4..20 mA * with display
ALTM2		Strap-on temperature sensor separate sensor - over 100°C Strap band 300 mm, dimensions 72 x 64 x 39,4 mm Output 0..10V, power supply 24 V DC	* output 4..20 mA * with display * other measuring ranges
ATM1		Outside temperature sensor -50...50 °C, dimensions 72 x 64 x 39,4 mm Wall mounting, output 0..10V, power supply 24 V DC	* with display * other measuring ranges
ATM2		Outside temperature sensor -50...50 °C, dimensions 72 x 64 x 39,4 mm Measuring element in external steel pocket Wall mounting, output 0..10V, power supply 24 V DC	* output 4..20 mA * with display * other measuring ranges
ETM1		Pocket temperature sensor 0...100 °C, dimensions 72 x 64 x 39,4 mm + sleeve Brass nickel-plated pocket 1/2", 150 mm, 10 bar Output 0..10V, power supply 24 V DC	* output 4..20 mA * with display * other measuring ranges * pockets 50, 100, 150, 200, 250, 300 mm
ETM2		Pocket temperature sensor 0...100 °C, dimensions 72 x 64 x 39,4 mm + sleeve Stainless steel pocket 1/2", 150 mm, 40 bar Output 0..10V, power supply 24 V DC	* output 4..20 mA * with display * other measuring ranges * pockets 50, 100, 150, 200, 250, 300 mm
HFTM		Sleeve sensor 0...100 °C, dimensions 6 x 50 mm + cable + box Mounting into pocket (not included), IP65, cable 1.5 m Output 0..10V, power supply 24 V DC	* output 4..20 mA * with display * other measuring ranges * cable teflon up to 250 °C, glass fibre w/ steel mesh up to 350 °C

Type	Description	Options and comments
KTM1	Duct / air duct temperature sensor 0...100 °C, dimensions 72 x 64 x 39,4 mm + probe Stainless steel probe 6 x 150 mm, IP65 Output 0..10V, power supply 24 V DC	* output 4..20 mA * with display * other measuring ranges * stem length 50, 100, 150, 200, 250, 300 mm
MWTM	Mean value temperature sensor 0...50 °C, dimensions 72 x 64 x 39,4 mm + probe 400 mm Copper coated probe 5 x 150 mm, IP65 Output 0..10V, power supply 24 V DC	* output 4..20 mA * with display * other measuring ranges * length 0.4, 3, 6 m or custom up to 20 m
RTM1	Room temperature sensor 0...50 °C, dimensions 79 x 81 x 26 mm Wall mounting, output 0..10V, power supply 24 V DC Enclosure ABS, colour pure white RAL9010	* output 4..20 mA * with display * other measuring ranges * stainless steel cover
RPTM1	Pendulum room temperature sensor 0...50 °C, dimensions 72 x 64 x 39,4 mm + probe 1,5 m Output 0..10V, power supply 24 V DC	* output 4..20 mA * other measuring ranges * cable length 3 m, 6 m or custom
RPTM2	Pendulum room temperature sensor 0...50 °C, dimensions 72 x 64 x 39,4 mm + probe 1,5 m, plastic globe 50 mm Output 0..10V, power supply 24 V DC	* output 4..20 mA * other measuring ranges * cable length 3 m, 6 m or custom

PERIPHERIALS / HUMIDITY SENSORS

KFF-U	Duct humidity sensor capacitive element, 40..60% rH: 3%, 10..90% rH: 5% stem 14 x 230 mm, IP65 Output 0..10V, power supply 24 V AC/DC	* output 4..20 mA KFF-I * display
KFTF-U	Duct humidity and temperature sensor capacitive element, 40..60% rH: 3%, 10..90% rH: 5% temperature 0..50 °C, stem 14 x 230 mm, IP65 Output 2 x 0..10V, power supply 24 V AC/DC	* outputs 4..20 mA KFTF-I * display * passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
AFF-U	On-wall humidity sensor capacitive element, 40..60% rH: 3%, 10..90% rH: 5% stem 14 x 45 mm, IP65 Output 0..10V, power supply 24 V AC/DC	* output 4..20 mA AFF-I * display

Type		Description	Options and comments
AFTF-U		On-wall humidity and temperature sensor capacitive element, 40..60% rH: 3%, 10..90% rH: 5% temperature -20..+80 °C, stem 14 x 45 mm, IP65 Output 2 x 0..10V, power supply 24 V AC/DC	* outputs 4..20 mA AFTF-I * display * passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
KFF-20U		Duct humidity sensor, high-precision 20..90% rH: 2% at 20 °C, 10..90% rH: 3% stem 14 x 230 mm, IP65 Output 0..10V, power supply 24 V AC/DC	* output 4..20 mA KFF-20I * display
KFTF-20U		Duct humidity and temperature sensor, high-precision 20..90% rH: 2% at 20 °C, 10..90% rH: 3% capacitive element 0..50 °C, stem 14 x 230 mm, IP65 Output 2 x 0..10V, power supply 24 V AC/DC	* outputs 4..20 mA KFTF-20I * display
AFF-20U		On-wall humidity sensor, high-precision 20..90% rH: 2% at 20 °C, 10..90% rH: 3% stem 14 x 45 mm, IP65 Output 0..10V, power supply 24 V AC/DC	* output 4..20 mA AFF-20I * display
AFTF-20U		On-wall humidity and temperature sensor, high-precision 20..90% rH: 2% at 20 °C, 10..90% rH: 3% range temperature -20..+80 °C, stem 14 x 45 mm, IP65 Output 2 x 0..10V, power supply 24 V AC/DC	* outputs 4..20 mA AFTF-20I * display
KAFTF		Duct absolute humidity and temperature sensor stem 14 x 230 mm, IP65 0..80 g/m3, 0..50 °C Output 2 x 0..10V, power supply 24 V AC/DC	* display
AAFTF		On-wall outdoor absolute humidity and temperature sensor 73.5 x 70 x 108 mm, stem 14 x 45 mm, IP65 0..80 g/m3, 0..50 °C Output 2 x 0..10V, power supply 24 V AC/DC	* display
RFF-U		Room humidity sensor capacitive element, 40..60% rH: 3%, 10..90% rH: 5% Output 0..10V, power supply 24 V AC/DC Wall mounting, dimensions 79 x 81 x 26 mm	* output 4..20 mA RFF-I * display
RFTF-U		Room humidity and temperature sensor capacitive element, 40..60% rH: 3%, 10..90% rH: 5%, temperature 0..+50 °C, output 2 x 0..10V, power supply 24 V AC/DC, wall mounting, dimensions 79 x 81 x 26 mm	* outputs 4..20 mA RFTF-I * display * passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
RPFF-U		Pendulum room humidity sensor capacitive element, 20..90% rH: 3% at 20°C, otherwise 5%, output 0..10V, power supply 24 V AC/DC dimensions 72 x 64 x 39,4 mm, cable 2 m	* output 4..20 mA RPFF-I * display
RPFTF-U		Pendulum room humidity and temperature sensor capacitive element, 20..90% rH: 3% at 20°C, otherwise 5%, temperature 0..+50 °C, output 2x 0..10V, power supply 24 V AC/ DC, dimensions 72 x 64 x 39,4 mm, cable 2 m	* outputs 4..20 mA RPFTF-I * display

PERIPHERIALS / PRESSURE SENSORS

SHD-U1		Pressure sensor for liquid and fluid media Power supply 24 V AC/DC, output 0..10V, ext. thread G1/2", stainless steel, overload 2x measuring range, temp. range -40..100°C, IP65 (SHD-I.. available only for DC power supply)	* SHD-U2.5, SHD-U6, SHD-U10,SHD- U16,SHD-U25,SHD-U40 (number = max. measuring range in bar) * output 4..20 mA SHD-I..
DF-50U		Differential pressure sensor 0..50 Pa Power supply 24 V AC/DC, output 0..10V, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 72 x 64 x 39,4 mm, IP65	

Type	Description	Options and comments
1010	**Differential pressure sensor 0..100 - 1000 Pa** Power supply 24 V AC/DC, output 0..10V, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65. Adjustable ranges 0...100, 300, 500, 1000 Pa.	* 1011 output 4...20 mA, DC power only
1050	**Differential pressure sensor 0..1000 - 5000 Pa** Power supply 24 V AC/DC, output 0..10V, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65. Adjustable ranges 0...1000, 2000, 3000, 5000 Pa.	* 1051 output 4...20 mA, DC power only
DF-50I	**Differential pressure sensor 0..50 Pa** Power supply 15..30 V DC, output 4..20 mA, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65	
DF-25/+25U	**Differential pressure sensor -25..+25 Pa** Power supply 24 V AC/DC, output 0..10V, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 72 x 64 x 39,4 mm, IP65	* DF-50/+50U (number = max. measuring range in Pa)
DF-100/+100U	**Differential pressure sensor -100..100 Pa** Power supply 24 V AC/DC, output 0..10V, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 72 x 64 x 39,4 mm, IP65	* DF-500/+500U, DF-1000/+1000U, DF-2000/+2000U (number = max. measuring range in Pa)
DF-25/+25I	**Differential pressure sensor -25..+25 Pa** Power supply 15..30 V DC, output 4..20 mA, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65	* DF-50/+50I (number = max. measuring range in Pa)
DF-100/+100I	**Differential pressure sensor -100..100 Pa** Power supply 15..30 V DC, output 4..20 mA, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65	* DF-500/+500I, DF-1000/+1000I, DF-2000/+2000I (number = max. measuring range in Pa)
SDF-50U	**Differential pressure sensor 0..50 Pa, display** Power supply 24 V AC/DC, output 0..10V, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 72 x 64 x 39,4 mm, IP65	
1110	**Differ. pressure sensor 0..100 - 1000 Pa, display** Power supply 24 V AC/DC, output 0..10V, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65. Adjustable range 0...100, 300, 500, 1000 Pa.	* 1111 output 4...20 mA, DC power only
1150	**Differ. pressure sensor 0..1000 - 5000 Pa, display** Power supply 24 V AC/DC, output 0..10V, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65. Adjustable ranges 0...1000, 2000, 3000, 5000 Pa.	* 1151 output 4...20 mA, DC power only
SDF-50I	**Differential pressure sensor 0..50 Pa, display** Power supply 15..30 V DC, output 4..20 mA, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65	
1310	**Differ. pressure sensor -1000...1000 Pa, display** Power 24 V AC/DC, output 0..10V + C/O contact, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65. Adjustable ranges +/- 300, 500, 750, 1000 Pa.	
1350	**Differ. pressure sensor -5000...5000 Pa, display** Power 24 V AC/DC, output 0..10V + C/O contact, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65. Adjustable ranges +/- 1500, 2500, 3500, 5000 Pa.	
SDF-25/+25U	**Differential pressure sensor -25..25 Pa, display** Power supply 24 V AC/DC, output 0..10V, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 72 x 64 x 39,4 mm, IP65	* SDF-50/+50U (number = max. measuring range in Pa)

Type	Description	Options and comments
SDF-100/+100U	**Differential pressure sensor -100..100 Pa, display** Power supply 24 V AC/DC, output 0..10V, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 72 x 64 x 39,4 mm, IP65	* SDF-500/+500U, SDF-1000/+1000U, SDF-2000/+2000U (number = max. measuring range in Pa)
SDF-25/+25I	**Differential pressure sensor -25..25 Pa, display** Power supply 15..30 V DC, output 4..20 mA, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65	* SDF-50/+50I (number = max. measuring range in Pa)
SDF-100/+100I	**Differential pressure sensor -100..100 Pa, display** Power supply 15..30 V DC, output 4..20 mA, including hose set 4/6 x 2000 mm, for non-aggressive and non-combustible gases, dimensions 108 x 72,5 x 70 mm, IP65	* SDF-500/+500I, SDF-1000/+1000I, SDF-2000/+2000I (number = max. measuring range in Pa)

PERIPHERIALS / OTHER SENSORS

Type	Description	Options and comments
AHKF-U	**Outdoor light intensity sensor** Power supply 24 V AC/DC, measuring range 0..500 lx / 20 klx / 60 klx (switchable), output 0..10V, wall-mounted, IP65, dimensions 72 x 64 x 39,4 mm	* AHKF-I, 4..20 mA
RHKF-U	**Room light intensity sensor** Power supply 24 V AC/DC, measuring range 0..500 lx / 1 klx / 20 klx (switchable), output 0..10V, wall-mounted, IP30, dimensions 79 x 81 x 26 mm	* RHKF-I, 4..20 mA
ABWF-W	**Outdoor motion sensor/presence detector** Power supply 24 V AC/DC, output 230V / 2A change-over, IR, beam angle 360 ° x 110°, operating range ca. 10 m, timeout adjustable 4 s ... 16 min., wall-mounted, IP65	
DBWF-W	**Ceiling built-in motion sensor/presence detector** Power supply 24 V AC/DC, output 230V / 2A change-over, beam angle 360 ° x 110°, operating range ca. 10 m, timeout adjustable 4 s ... 16 min., ceiling mounted, IP65	
RBWF-W	**Room motion sensor/presence detector** Power supply 24 V AC/DC, output 230V / 2A change-overn, IR, beam angle 360 ° x 110°, operating range ca. 10 m, timeout adjustable 4 s ... 16 min., wall mounted, IP30	
RBWF/LF-US	**Room presence detector and light sensor** Power supply 24 V AC/DC, output presence: contact 230 V / 2 A, timeout adjustable 4 s ... 16 min., light: 0..10V ~ 0..1000 lx, wall mounted, IP30	* RBWF/LF-IS light output 4..20 mA
KLQ	**Duct air quality sensor** Power supply 24 V AC/DC, output 0..10 V or 4..20 mA ~ 100..0% air quality referred to calibration gas, VOC sensor, IP65	* KLQ-S extra NO contact 230 V / 0.5 A, setpoint internal * display
RLQ	**Room air quality sensor** Power supply 24 V AC/DC, output 0..10 V or 4..20 mA ~ 100..0% air quality referred to calibration gas, VOC sensor, IP30	* RLQ-S: extra NO contact 230 V / 0.5 A, setpoint internal * display * RLQ-A: 5 indicating LEDs
RCO2	**Room CO2 sensor** Power supply 24 V AC/DC, output 0..10 V ~ 0..2000 ppm, optical sensor NDIR, IP30	
RLQ-CO2	**Room air quality and CO2 sensor** Power supply 24 V AC/DC, output 2x 0..10 V ~ 0..2000 ppm (CO2, optical sensor NDIR), 100..0% AQ referred to calibration gas (quality, sensor VOC), IP30	* display

Type	Description	Options and comments
RTM-CO2	**Room temperature and CO2 sensor** Power supply 24 V AC/DC, outputs 2x 0..10 V ~ 0..2000 ppm (CO2, optical sensor NDIR), 0..50 °C (temperature), IP30	* RTM-CO2-A: 5 indicating LEDs
KCO2	**Duct CO2 sensor** Power supply 24 V AC/DC, output 0..10 V ~ 0..2000 ppm, optical sensor NDIR, IP65	* display
KLQ-CO2	**Duct air quality and CO2 sensor** Power supply 24 V AC/DC, outputs 2x 0..10 V ~ 0..2000 ppm (CO2, optical sensor NDIR), 100..0% AQ referred to calibration gas (quality, VOC sensor), IP65	* display
KO3-U	**Duct ozone sensor** Power supply 24 V AC/DC, output 0..10 V ~ 0..1 ppm, chemical sensor, dimensions 108 x 72,5 x 70 mm + stem 20 x 185 mm	* KO3-US extra contact, setpoint internal * display
RO3-U	**Room ozone sensor** Power supply 24 V AC/DC, output 0..10 V ~ 0..1 ppm, chemical sensor, dimensions 95 x 97 x 30 mm	* RO3-US extra contact, setpoint internal
KLGF-1	**Duct airflow monitor** Power supply 24 V AC/DC, output 0..10V ~ 0..30 m/s, mounting flange, stem 10 x 140 mm	* KLGF-2 power 230 V AC

PERIPHERIALS / THERMOSTATS

FS1-U	**Frost protection thermostat, active** Input: 0..10V valve signal, outputs: C/O contact, 0..10V temperature (equivalent to 0..15 °C), 0..10V control signal (input + frost protection), power supply 24 V AC/DC, dimensions 108 x 72.5 x 70 mm	* display * capillary length 3 m (FS1-U), 6 m (FS2-U)
FST	**Frost protection thermostat, mechanical** Output: change-over contact 10 (4) A, 250 V AC Dimensions 108 x 72.5 x 70 mm, IP65 Setpoint range -10..12 °C, hysteresis 1 K	* capillary length 6 m (FST-1D), 1.8 m (FST-3D), 3 m (FST-5D), 12m (FST-7D)
RTR-B121	**Room temperature controller, mechanical (heating)** Setpoint range +5...+30 °C, hysteresis 0.5 K Switching element: bimetal, contact 10 (4) A, 230 V AC Dimensions 79 x 81 x 26 mm	
RTR-B124	**Room temperature controller, mechanical (heating)** Setpoint range +5...+30 °C, hysteresis 0.5 K Switch element: bimetal, contact 10 (4) A, 230 V AC Dimensions 79 x 81 x 26 mm. Input for depression -5K	
RTR-B721	**Room temperature controller, mechanical (heating / cooling)** Setting range +5...+30 °C, hysteresis 0.5 K Bimetal, contacts 10 (4) A, 230 V heating, 5 (2) A cooling Dimensions 79 x 81 x 26 mm.	
RTR-B747	**Room temperature controller, mechanical (heating / cooling)** Setting range +5...+30 °C, hysteresis 0.5 K Bimetal, contacts 10 (4) A, 230 V AC heating, 5 (2) A cooling Dimensions 79 x 81 x 26 mm, internal setting	
ALTR-060	**Strap-on temperature controller 0...+60 °C** Temperature range 0...+60 °C, hysteresis 5 K change-over contact 16 (4) A, 24...250 V AC Dimensions 38 x 48 x 103 mm, IP40, external setting	* internal setting: ALTR-060U

Type	Description	Options and comments
ALTR-090	Strap-on temperature controller 0...+90 °C Temperature range 0...+90 °C, hysteresis 5 K change-over contact 16 (4) A, 24...250 V AC Dimensions 38 x 48 x 103 mm, IP40, external setting	* internal setting: ALTR-090U
ALTR-1	Strap-on temperature controller -35...+35 °C Temperature range -35...+35 °C, hysteresis 5 K Switching contact 16 (1.5) A, 24...250 V AC Dimensions 72.5 x 70 x 108 mm, IP65, external setting	* internal setting: ALTR-1U
ALTR-3	Strap-on temperature controller 0...+60 °C Temperature range 0...+60 °C, hysteresis 5 K change-over contact 16 (1.5) A, 24...250 V AC Dimensions 72.5 x 70 x 108 mm, IP65, external setting	* internal setting: ALTR-3U
ALTR-5	Strap-on temperature controller 0...+90 °C Temperature range 0...+90 °C, hysteresis 5 K change-over contact 16 (1.5) A, 24...250 V AC Dimensions 72.5 x 70 x 108 mm, IP65, external setting	* internal setting: ALTR-5U
ALTR-7	Strap-on temperature controller 0...+120 °C Temperature range 0...+120 °C, hysteresis 5 K change-over contact 16 (1.5) A, 24...250 V AC Dimensions 72.5 x 70 x 108 mm, IP65, external setting	* internal setting: ALTR-7U
ETR-060	Built-in temperature controller 0...+60 °C External setting temperature range 0...+60 °C, hyst. 3 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, brass pocket 1/2" 130 mm	* internal setting: ETR-060U * stainless steel pocket
ETR-090	Built-in temperature controller 0...+90 °C Internal setting temperature range 0...+90 °C, hyst. 3 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, brass pocket 1/2" 130 mm	* internal setting: ETR-090U * stainless steel pocket
ETR-0120	Built-in temperature controller 0...+120 °C External setting temperature range 0...+120 °C, hyst. 5 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, brass pocket 1/2" 130 mm	* stainless steel pocket
ETR-50140	Built-in temperature controller +50...+140 °C External setting temperature range +50...+140 °C, hyst. 5 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, brass pocket 1/2" 130 mm	* stainless steel pocket
ETR-R6585	Built-in temperature controller +65...+85 °C External setting temperature range +65...+85 °C, hyst. 15...20 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, brass pocket 1/2" 130 mm	STB function, restart after cooling down and manual reset * stainless steel pocket
ETR-R90110	Built-in temperature controller +90...+110 °C External setting temperature range +90...+110 °C, hyst. 15...20 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, brass pocket 1/2" 130 mm	STB function, restart after cooling down and manual reset * stainless steel pocket
ETR-060R85	Built-in temperature controller two-step Temperature range 0...+60 °C and +65..+85 °C, hyst. 3 and 15...20 K change-over contacts 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, brass pocket 1/2" 130 mm	upper step: STB function, restart after cooling down and manual reset * stainless steel pocket
ETR-090090U	Built-in temperature controller two-step Internal setting temperature range 0...+90 °C and 0..+90 °C, hyst. 3 and 3 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, brass pocket 1/2" 130 mm	* stainless steel pocket
ETR-090R110	Built-in temperature controller two-step Temperature range 0...+90 °C and +90..+110 °C, hyst. 3 and 15...20 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, brass pocket 1/2" 130 mm	upper step: STB function, restart after cooling down and manual reset * stainless steel pocket

Type		Description	Options and comments
ETR-1		**Built-in temperature controller -35...+35 °C** External setting temperature range -35...+35 °C, hyst. 3 K change-over contact 16 (1.5) A, 24...250 V AC, IP65 Dimensions 72.5 x 70 x 108 mm, brass pocket 1/2" 130 mm	* stainless steel pocket
KTR-060		**Duct temperature controller 0...+60 °C** External setting temperature range 0...+60 °C, hyst. 3 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, stem 14 x 205 mm	* internal settings: KTR-060U
KTR-090		**Duct temperature controller 0...+90 °C** Internal setting temperature range 0...+90 °C, hyst. 3 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, stem 14 x 205 mm	* internal settings: KTR-090U
KTR-0120		**Duct temperature controller 0...+120 °C** External setting temperature range 0...+120 °C, hyst. 3 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, stem 14 x 205 mm	
KTR-50140		**Duct temperature controller +50...+140 °C** External setting temperature range +50...+140 °C, hyst. 5 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, stem 14 x 205 mm	
KTR-R6585		**Duct temperature controller +65...+85 °C** External setting temperature range +65...+85 °C, hyst. 15…20 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, stem 14 x 205 mm	STB function, restart after cooling down and manual reset
KTR-R90110		**Duct temperature controller +90...+110 °C** External setting temperature range +90...+110 °C, hyst. 15…20 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, stem 14 x 205 mm	STB function, restart after cooling down and manual reset
KTR-060R85		**Duct temperature controller two-step** Temperature range 0...+60 °C and +65..+85 °C, hyst. 3 and 15…20 K change-over contacts 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, stem 14 x 205 mm	upper step: STB function, restart after cooling down and manual reset
KTR-090090U		**Duct temperature controller two-step** Internal setting temperature range 0...+90 °C and 0..+90 °C, hyst. 3 and 3 K change-over contacts 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, stem 14 x 205 mm	
KTR-090R110		**Duct temperature controller two-step** Temperature range 0...+90 °C and +90..+110 °C, hyst. 3 and 15…20 K change-over contact 16 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm, stem 14 x 205 mm	upper step: STB function, restart after cooling down and manual reset
KTR-1		**Duct temperature controller -35...+35 °C** External setting temperature range -35...+35 °C, hyst. 3 K change-over contact 16 (1.5) A, 24...250 V AC, IP65 Dimensions 72.5 x 70 x 108 mm, stem 14 x 205 mm	
TR-040		**Temperature controller 0...+40 °C** Temperature range 0...+40 °C, hysteresis 1 K change-over contact 10 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm	* internal setting: TR-040U
TR-060		**Temperature controller 0...+60 °C** Temperature range 0...+60 °C, hysteresis 1.5 K change-over contact 10 (1.5) A, 24...250 V AC, IP54 Dimensions 72.5 x 70 x 108 mm	* internal setting: TR-060U
TR-22		**Temperature controller -30...+30 °C** Temperature range -30...+30 °C, hysteresis (adjustable) 2...15 K, change-over contact 15 (8) A, 24...250 V AC, IP65 Dimensions 72.5 x 70 x 108 mm	* internal setting: TR-22U

Type	Description	Options and comments
TR-04040	**Duct temperature controller two-step 0...+40 °C** Temperature range 0...+40 °C and 0..+40 °C, hysteresis 1 K and 1 K, change-over contacts 10 (1.5) A, 24...250 V AC, IP65, dimensions 72.5 x 70 x 108 mm	* internal setting: TR-04040U

PERIPHERIALS / HYGROSTATS

TW-W	**Dew point sensor, active** Switches when reaching relative humidity setpoint. incl. 300 mm strap-on metal band Dimensions 64 x 72 x 39.4 mm, IP65 Power supply 24 V AC / DC, C/O contact 24 V	* no contact, output 0..10 V TW-U
KW-W	**Dew point sensor (condensing)** Switches at 95 %rH (adjustable), incl. 300 mm strap-on metal band Dimensions 64 x 72 x 39.4 mm, IP65 Power supply 24 V AC / DC, C/O contact 24 V	
RHT-1	**Room hygrostat and thermostat** 10..35 °C, 35..100 %rH, power supply 24..230 V AC, change-over contacts rH 5 (0.2) A, t 10(4)A, switch 127 x 75 x 25 mm, IP30	For flush box installation, order inclusive mounting frame ARA1.7E
RH-2	**Room hygrostat** 25..95 %rH, hyst. 4%rH, power supply 24..230 V AC, change-over contact 5 (0.2) A 95 x 97 x 30 mm, IP30	* internal setting RH-2U
KH-30W	**Duct hygrostat, electronic** Power supply 24 V AC/DC, change-over contact 10 (6) A, output 0..10V. Dimensions 108 x 72,5 x 70 mm, stem 20 x 185 mm, IP65, internal setting.	* display Accessories (to be ordered separately): flange MF-16-K, wall installation clamp WH-20
KH-10	**Duct hygrostat, mechanical** Setpoint 35..100 %rH, change-over contact 24..250 V AC, 15 (8) A. Dimensions 108 x 72,5 x 70 mm, stem 19 x 220 mm, IP65	* internal setting: KH10-U Accessories (to be ordered separately): flange MF-16-K, wall installation clamp WH-20
KH-20	**Duct hygrostat, mechanical, 2 stages** Setpoint 35..100 %rH, St1 to St2 3..18 %rH, change-over contacts 24..250 V AC, 15 (8) A. Dimensions 108 x 72,5 x 70 mm, stem 19 x 220 mm, IP65	* internal setting: KH20-U Accessories (to be ordered separately): flange MF-16-K, wall installation clamp WH-20

PERIPHERIALS / PRESSURE SWITCHES

DS-106	**Differential pressure switch 20..300 Pa** Contact 5(0.8)A, 12..250 V AC, ambient temperature -30..85°C, silicone membrane, dimensions 81 x 54 mm, IP54 Inclusive connecting set: hose 2 m and nipples.	* DS-106A 50..500 Pa DS-106B 100..1000 Pa DS-106C 500..2000 Pa DS-106D 1000..5000 Pa
DS-205F	**Differential pressure switch 20..200 Pa** Contact 1.5(0.4)A, 12..250 V AC, ambient temperature -20..85°C, silicone membrane, dimensions 98 x 57,8 mm, IP54 Inclusive connecting set: hose 2 m and nipples.	* DS-205B 50..500 Pa DS-205D 200..1000 Pa

PERIPHERIALS / SWITCHING SENSORS

KLSW-3	**Airflow control switch, electronic** 0.1..30 m/s (adjustable), relay 230 V / 10 A, power supply 230 V AC, adjustable switch-on (15..120 s) and switch-off (2..20 s) delay, dimensions 108 x 72,5 x 70 mm + stem 10 x 140 mm	* KLSW-4 power supply 24 V AC/DC
KLSW-5	**Airflow control switch, 2 stages, electronic** 0.1..15 m/s (adjustable), relay 230 V /10 A, power supply 230 V AC, adjustable switch-on (15..120 s) and switch-off (2..20 s) delay, dimensions 108 x 72,5 x 70 mm + stem 10 x 140 mm	* KLSW-6 power supply 24 V AC/DC

Type	Description	Options and comments
WFS-1EPL	**Airflow control switch, mechanical** 2.5...9.2 m/s (adjustable), relay 24...250 V / 15(8) A, 108 x 72,5 x 70 mm + vane 80 x 175 mm, suitable for polluted air (oily vapours)	Accessories PWFS-08 - spare vane
SW	**Flow monitor, mechanical** 1..90 m/s (adjustable using different paddle lenghts and setpoint knob), relay 24..250 V / 15(8) A, 108 x 73,5 x 70 mm + paddle 29x34...167 mm, screwed socket 1", suitable for liquid and gaseous media up to 120 °C	

PERIPHERIALS / ROOM UNITS

Type	Description	Options and comments
RTF LT	**Room temperature sensor, button, LED** Wall mounted, dimensions 79 x 81 x 26 mm Measuring element Pt1000 ABS, colour: white RAL9010	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
RTF T	**Room temperature sensor, button** Wall mounted, dimensions 79 x 81 x 26 mm Measuring element Pt1000 ABS, colour: white RAL9010	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
RTF P	**Room temperature sensor, setpoint** Wall mounted, dimensions 79 x 81 x 26 mm Measuring element Pt1000, setpoint potentiometer 1K5	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * setpoint from the R6 range * various scales / arrow shapes
RTF PT	**Room temperature sensor, button, setpoint** Wall mounted, dimensions 79 x 81 x 26 mm Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * setpoint from the R6 range * various scales / arrow shapes
RTF LPT	**Room temperature sensor, button, setpoint, LED** Wall mounted, dimensions 79 x 81 x 26 mm Measuring element Pt1000	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * setpoint from the R6 range * various scales / arrow shapes * LED colors
RTF DP	**Room temperature sensor, switch 0-I-II-III, setpoint** Wall mounted, dimensions 79 x 81 x 26 mm. Measuring element Pt1000, stage switch up to 50 V	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * setpoint from the R6 range * various scales / arrow shapes * stage switch with resistors
RTF PW	**Room temperature sensor, setpoint, switch** Wall mounted, dimensions 79 x 81 x 26 mm Measuring element Pt1000, on/off switch up to 50 V	* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm * setpoint from the R6 range * various scales / arrow shapes

PERIPHERIALS / ROOM CONTROLLERS

Type	Description	Options and comments
RTR-S010	**Room controller - heating and cooling** Setpoint +5...+30 °C, P band 1..5 K Power supply 24 V AC/DC, output 2x 0..10 V / 10..0 V, 5 mA Dimensions 95 x 97 x 30 mm, IP30	
RTR-S011	**Room controller - heating and cooling** Setpoint 21 °C 8 K, P band 1..5 K Power supply 24 V AC/DC, output 2x 0..10 V / 10..0 V, 5 mA Dimensions 95 x 97 x 30 mm, IP30	
RTR-S012	**Room controller - heating and cooling** Setpoint +5...+30 °C, P band 1..5 K Power supply 24 V AC/DC, output 2x 0..10 V / 10..0 V, 5 mA Dimensions 95 x 97 x 30 mm, IP30, 2x LED (heat / cool)	Temperature sensor external Pt1000, must be ordered separately

Type	Description	Options and comments
RTR-S013	Room controller - heating and cooling Setpoint 21 °C 8 K, P band 1..5 K Power supply 24 V AC/DC, output 2x 0..10 V / 10..0 V, 5 mA Dimensions 95 x 97 x 30 mm, IP30, 2x LED (heat / cool)	Temperature sensor external Pt1000, must be ordered separately
RTR-S014	Room controller - heating and cooling, fancoil Setpoint +5...+30 °C, P band 1..5 K Power supply 24 V AC/DC, output 2x 0..10 V / 10..0 V, 5 mA Dimensions 95 x 97 x 30 mm, IP30, 2x LED (heat / cool)	Temperature sensor external / internal Pt1000, fancoil switch 230 V 0-I-II-III
RTR-S015	Room controller - heating and cooling, fancoil Setpoint 21 °C 8 K, P band 1..5 K Power supply 24 V AC/DC, output 2x 0..10 V / 10..0 V, 5 mA Dimensions 95 x 97 x 30 mm, IP30, 2x LED (heat / cool)	Temperature sensor external / internal Pt1000, fancoil switch 230 V 0-I-II-III

PERIPHERIALS / VALVES

VD121-15 0,16	2-port control valve, threaded PN16, DN15, Kvs = 0,16 incl. actuator 24 V AC, 0..10 V	* Kvs 0,25, 0,4, 0,63, 1,0, 1,6, 2,5, 4.
VD121-20 6,3	2-port control valve, threaded PN16, DN20, Kvs = 6,3 incl. actuator 24 V AC, 0..10 V	
VD121-25 10	2-port control valve, threaded PN16, DN25, Kvs = 10 incl. actuator 24 V AC, 0..10 V	
VD121-32 16	2-port control valve, threaded PN16, DN32, Kvs = 16 incl. actuator 24 V AC, 0..10 V	
VD121-40 25	2-port control valve, threaded PN16, DN40, Kvs = 25 incl. actuator 24 V AC, 0..10 V	
VD131-15 0,25	3-port control valve, threaded PN16, DN15, Kvs = 0,25 incl. actuator 24 V AC, 0..10 V	* Kvs 0,4, 0,63, 1,0, 1,6, 2,5, 4.
VD131-20 6,3	3-port control valve, threaded PN16, DN20, Kvs = 6,3 incl. actuator 24 V AC, 0..10 V	
VD131-25 10	3-port control valve, threaded PN16, DN25, Kvs = 10 incl. actuator 24 V AC, 0..10 V	
VD131-32 16	3-port control valve, threaded PN16, DN32, Kvs = 16 incl. actuator 24 V AC, 0..10 V	
VD131-40 25	3-port control valve, threaded PN16, DN40, Kvs = 25 incl. actuator 24 V AC, 0..10 V	

Type		Description	Options and comments
VD123 50		2-port control valve, flanged PN16, DN50, Kvs = 40 incl. actuator 24 V AC, 0..10 V	
VD123 65		2-port control valve, flanged PN16, DN65, Kvs = 63 incl. actuator 24 V AC, 0..10 V	
VD123 80		2-port control valve, flanged PN16, DN80, Kvs = 100 incl. actuator 24 V AC, 0..10 V	
VD123 100		2-port control valve, flanged PN16, DN100, Kvs = 160 incl. actuator 24 V AC, 0..10 V	
VD123 125		2-port control valve, flanged PN16, DN125, Kvs = 250 incl. actuator 24 V AC, 0..10 V	
VD123 150		2-port control valve, flanged PN16, DN150, Kvs = 360 incl. actuator 24 V AC, 0..10 V	
VD133 50		3-port control valve, flanged PN16, DN50, Kvs = 40 incl. actuator 24 V AC, 0..10 V	
VD133 6		3-port control valve, flanged PN16, DN65, Kvs = 63 incl. actuator 24 V AC, 0..10 V	
VD133 80		3-port control valve, flanged PN16, DN80, Kvs = 100 incl. actuator 24 V AC, 0..10 V	
VD133 100		3-port control valve, flanged PN16, DN100, Kvs = 160 incl. actuator 24 V AC, 0..10 V	
VD133 125		3-port control valve, flanged PN16, DN125, Kvs = 250 incl. actuator 24 V AC, 0..10 V	
VD133 150		3-port control valve, flanged PN16, DN150, Kvs = 360 incl. actuator 24 V AC, 0..10 V	

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